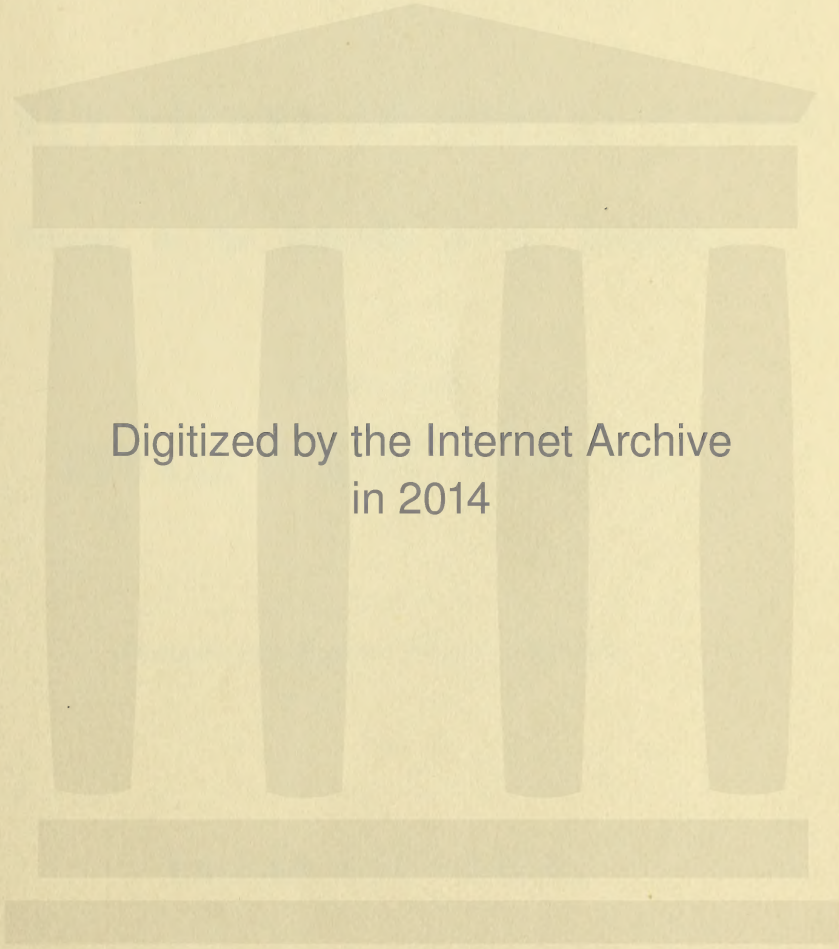
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THE

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A

MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

Observe — Compare — Reflect — Record.

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CONTENTS OF VOLUME LII.

1910.

First pages of monthly issues: JANUARY, 1. FEBRUARY, 133. MARCH, 261. APRIL, 389. MAY, 517. JUNE, 629. JULY, 729. AUGUST, 841. SEPTEMBER, 949. OCTOBER, 1053. NOVEMBER, 1185. DECEMBER, 1321.

ORIGINAL COMMUNICATIONS.

Action (The) of Formocresol 559
Advent (The) of Painless Dentistry ... 868
Adventitious Effect (The) of Large Masses of Gold in Contact with Tooth Tissues 389
Application (The) of Successful Business Principles in Dental Practice.. 181
Are the "New School Orthodontists" Practicing Excessive Expansion? ... 955
Bleaching (The) of Porcelain Fillings 1221
"Bone-growing" 261
Care (The) of the Teeth of Children: Our Duty to the Men and Women of the Future 738
Casting: a Review and Commentary, Including a Special Technique 873
Chemical and Physical Characteristics of Porcelain, and Their Relation to Its Manipulation 48
Chemical Changes (The) of the Foodstuffs During Digestion 285
Clinical Experience and Observations in the Treatment of Pyorrhea Alveolaris 851
Conditions (The) of Success 1200
Condition of the Teeth of Public School Children in New South Wales 755
Consideration (A) of the Question of Susceptibility and Immunity to Dental Caries 729
Crown (A), Useful at Times 438
Deficient Development of the Arches of the Deciduous Teeth, and the Necessity of Early Treatment 1185
Dental Clinics in Manila: Schools, Prison, Hospital, and Orphanage ... 887
Dental Service as a Public Health Measure 969
Dental Skiagraphy 418
Dentist (The) and the Law 309
Dentistry, Past and Present, as Seen by a Modern Hygienist 42
Dietetics 441
Diseased Roots and Devitalized Teeth 194
Drugs and the Dental Profession 303
Duty of the General Practitioner Toward Cases of Orthodontia which Occur in His Practice 1087
Effects of Brachycephaly and Dolichocephaly on the Teeth of Man 517
Enamel Softening and Rehardening as a Factor in Erosion 46
Ethics 133, 841
Facial Neuralgia 1335
Fletcherism, and Some of Its Effects on Nutrition 752
Function of the Teeth in the Development of the Face 1053
God's Poor and a Few "Poor Devils" 444
Gold Inlay (The) 1339
Gold Insets 744
Hot Water in Dentistry 1082
Incidents in the Practice of an Oral Surgeon 949
Insanity Caused by Painless Dental Disease 526
Investigations on Plaque Formation and Dental Caries in Relation to Saliva 170
Is It Necessary to Use Secret Formula Preparations in the Practice of Dentistry? 429

Need (The) of a Code of Dental Ethics 321
New Era (A) in Dental Educational Standards 1211
Odd Cases 535
On Dental Caries 420
Oral Hygiene and American Dental Schools 647
Oral Prophylaxis as a Means to Prevent Ocular Diseases 745
Orthodontia 1223
Orthodontia and Orthopedia of the Face, and the Influence of Expansion of the Dental Arches in Establishing Normal Respiration 1353
Oxyphosphate Cements 1225
Phosphor-Necrosis 424
Physico-prosthetic Crown and Bridge (The), with Reference to Fundamentals 973
Pleomorphism and the Pleomorphists: A Plea for Further Investigation of the Micro-organisms of the Deposit upon the Teeth 658
Potassium Sulfocyanate in the Saliva 1346
Practical Application (The) of Oral Hygiene to the School Curriculum .. 863
Practical Dental Therapeutics 1217
Practical Treatment (The) of True Pyorrhea Alveolaris 856
Problem (The) of Articulation, 1, 148, 268, 403
Professional Opportunity 1079
Progress (The) of Dental Science and Art 1321
Proper Use of a Normal and Hygienic Buccal Cavity, and Its Effect on the Health and Nutrition of the Body .. 551
Proposed Application (A) of Compressed Antiseptic Gases to Operative Dentistry 737
Psychology (The) of the Tool-using Faculty 882
Public Dental Hygiene: an Address to the Dental Profession of America .. 1351
Pyorrhea Alveolaris from a Bacteriological Standpoint 52
Question (The) of Medical Education for the Dentist 34
Relation (The) of the Diseases of the Nose and Pharynx to Dentistry 1073
Relative Merits (The) of the Cast and the Malleted Gold Filling 57
Relief of Pain (The) During Dental Operations 293
Report (A) of Two Cases of Dentigerous Cysts 283
Report on a Case of Alveolar Abscess with Extensive Necrosis 176
Riggs' Disease 539
Rip Van Winkles in American Dental College Faculties 298
Sectional Inlays 1204
Some Fallacies in Orthodontia 191
Some New Researches into Amalgams and Their Significance in Dental Practice 20
Surgical Dressing in Oral Operations 323
Surgical Operation of the Frenum Labii Superioris 986
Suspected Case (A) of Ludwig's Angina 645
Systematic Indexing and Classification of Dental Literature and Its Possible Results 629
Thoughts on the Gold Inlay 317
Timely Thought or Two (A) 637
Treatment of Fractures of the Maxillæ 981
Treatment (The) of Children's Teeth 144
Trigeminal Neuralgia and Neuralgias of More Definite Etiology 654
True Art in Dental Prosthetics 1066
Tuberculosis: Preventive Measures for the Dentist and His *Clientèle* 1332
Tumors 314
Twentieth Century Dentistry 1089
Unique Alveolar Abscesses 750
"What We Have to Give" 37

Papers in Society Proceedings.

Cavity Preparation for Gold Inlays ... 1260
Cleanliness in the Dental Office 1268
Oral Hygiene in Alabama 66
Oral Hygiene: Inauguration of the Present Movement 1117
Oral Prophylaxis as a Special Field of Work in Dentistry 909
Orthodontia 989
Plea (A) for the Porcelain Inlay 1250
Pot-pourri 362
President's Address (International Dental Federation) 772
President's Address (National Dental Association) 1097

President's Address (Northeastern Dental Association) 351
President's Address (Pennsylvania State Dental Society) 1382
Report of Committee on Dental Science and Literature (Pennsylvania State Dental Society) 1376
Report of Committee on Oral Hygiene (National Dental Association, Southern Branch) 1103
Report of Committee on Oral Hygiene and Public School Dental Education in Pennsylvania (Pennsylvania State Dental Society) 1378
Report of Committee on Pathology, Materia Medica, and Therapeutics (National Dental Association, Southern Branch) 1261
Report of Committee on Practice (New York State Dental Society) 999
Report of Committee on Scientific Research (National Dental Association) 1234
Report of Committee on Scientific Research (New York State Dental Society) 1141
Report of the Correspondent (Dental Society of the State of New York) 1270
Report of the Dental Hygiene Council (New York State Dental Society) .. 1150
Some Advantages of the Stone Model Method in Making Gold and Porcelain Restorations 1015
Some Things in Operative Dentistry .. 1255
State Association's (The) Part in the Oral Hygiene Propaganda 1105
Warning (A) Against Dental Fads ... 1253
What Constitutes a Cure of Pyorrhea Alveolaris, and How May It Be Accomplished? 1126
What Medicine and Dentistry Need ... 563

CORRESPONDENCE.

Barring (The) of the D.D.S. in Italy .. 325
Dental Interne to be Appointed at Bellevue Hospital 1230
Dentistry in Italy: The "Istituto Stomatologico Italiano" 759
Dr. Talbot and the Medical *Ignis Fatuus* 661
Educational Campaign (The) 205
Is Dentistry a Science? an Open Letter to Dr. G. V. Black 196
Ludwig's Angina Due to Impacted Third Molar 1092
Pulp Diagnosis by the Induced Current Employed by Dr. Marshall Nearly Twenty Years Ago 326
Rejoinder to Dr. G. V. Black's Reply to "Open Letter" 456
Relation of the Individual Practitioner to Free Dental Services 660
Reply to Dr. Fenchel's Open Letter 199
Reply to Dr. Summa 562
Some Experiences with "Tartar Solvent" 63

PROCEEDINGS OF SOCIETIES.

American Dental Society of Europe—meeting held in Paris 793
Connecticut State Dental Association, 1013, 1122
Dental Faculties Association of American Universities 1399
Dental Society of the State of New York 78, 999, 1126, 1270, 1390
First District Dental Society of the State of New York ...206, 458, 680, 760
International Dental Federation ..663, 772
Maryland State Dental Association and District of Columbia Dental Society 339, 563
National Dental Association—
General Sessions .....('10) 1093, 1231
Section I .....('10) 1241, 1361
Section II .....('10) 1367
Section III .....('09) 65
National Dental Association, Southern Branch 988, 1103, 1250
New York Odontological Society ..327, 894
Northeastern Dental Association ..350, 469
Pennsylvania State Dental Society 217, 1376
Seventh and Eighth District Dental Societies, State of New York, 360, 476, 588
Susquehanna Dental Association of Pennsylvania 99

EDITORIAL.

Commercial Philanthropy 486
Compend (A) of Histology 491
Concerning Money and Some Other Things 236
Corrigenda 1035
Dental Hygiene Movement (The) 687
Dental Mechanics as a Problem in the Curriculum 1032
Dentistry and the Public Service 103
International Hygiene Exhibition (The) 1300
International Memorial (The) to Willoughby D. Miller 368
Mouth Disorders and the Death-rate ... 1159
Our Frontispiece 689
Paris Meetings, The 597
Remarkable Benefaction (A) 598
Stomatological Symposium (The) 928
Swing (The) of the Pendulum 1405
What Next? 798
Where Praise is Due 801

BIBLIOGRAPHICAL.

Anatomy and Histology of the Mouth and Teeth 492
Anomalies de l'Occlusion Dentaire et Orthodontie [Anomalies of Dental Occlusion and Orthodontia] 601
Atlas der Zahnheilkunde in Stereoskopischen Bildern [Atlas of Dental Science in Stereoscopic Views] 690
Bau und Entwickelung der Mundhoehle des Menschen unter Beruecksichtigung der Vergleichenden Anatomie des Gebisses und mit Einschluss der Speziellen Mikroskopischen Technik [Structure and Development of the Oral Cavity in Man] 242
Behandlung der Okklusionsanomalien der Zaehne—Angle's System [On the Treatment of Malocclusion of the Teeth] 600
Compend of Histology 491
Dental Materia Medica and Therapeutics with Special Reference to the Rational Application of Remedial Measures to Dental Diseases 240
Die Technik die Harnuntersuchung und ihre Anwendung in der Zahnaertzlichen Praxis [Technique of Urinalysis] 492
Old and New Dental Journals 691

REVIEW OF CURRENT DENTAL LITERATURE.

Aconitin in Facial Neuralgia 1169
Aluminum Dentures 602
Alypin in Dental Practice 1303
Amalgam Crowns 1305
Antiseptic Value of Fillings and Dressings 374
Application of Sulfurous Acid in Dentistry 934
Application of the Casting Process in a Combined Pin and Tube Tooth on a Bicuspid with Diverging Root-canals 493
Aqueous and Oleaginous Solutions in the Therapy of Caries 606
Artificial Dentures and Their Dangers 500
Bacteriological Investigation on Some Modern Mouth Disinfectants (Formamint and Pyocyanase) 243
Bromural and Its Application in Dentistry 602
Carcinoma of the Tongue 1038
Casting Aluminum Plates 1308
Cast Upper Metal Denture with Suction Chamber 604
Characteristic Reaction of the Saliva in Dental Arthritis 1410
Chemical and Mechanical Abrasion of the Teeth 804
Closing of the Perforated Apex of the Root, with Subsequent Filling of the Root-canal by a New Method 375
Collarless Pivot Tooth (A) 1036
Contribution to the Hot-air Therapy .. 934
Contribution to the Pathogenic Study of Discoloration of the Teeth 1412
Contribution to the Simplification and Uniform Method of Prosthetic Treatment of Resection and Exarticulation of the Mandible 373

Contribution to the Study of Cocain Anesthesia 1039
Contribution to the Therapy of Pulpitis —Devitalization of the Pulp with Codrenin 802
Correct Setting-up of Artificial Teeth in Lower Prognathism 114
Creasote-iodoform as a Caustic in Deciduous Teeth 1038
Currettage of the Alveolus and the Root in Chronic Alveolar Abscess 115, 693
Dental Diseases in Various Occupations 935
Dental Erosion and Tuberculosis 1041
Dental Treatment of London School Children 1163
Dermatol for Pyorrhea Alveolaris 609
Disinfection of the Oral Cavity with Formamint 248
Experiments on Tooth Implantation .. 802
Failures in Surgical Root-treatment (Resection of the Apex) and Their Causes 1163
Ferments, Especially Lactic Ferment, in Oral Therapeutics 606
Formaldehyd and Tricresol in Dental Therapeutics 107
Gingivitis in Diabetes 1164
Gold Filling and Gold Inlay 695
Hemostasis Without Medication 608
How to Hasten the Shedding of Deciduous Teeth 608
How to Overcome the Brittleness of Gold in Casting 608
Improvement on the Transverse Bar of Bryan in Bridge Work 607, 696
Insulating Cement 608
Investigation on the Osmotic Pressure of Some Local Anesthetics 605
Investigations on the Anatomic Conditions for the Processes of Metabolism and Sensibility in Hard Tooth Substances 110
Investigations on the Applicability of Celluloid in Dental Technics 109
Iodin and Calcium Hypochlorite in Abnormal Discoloration of the Teeth ... 374
Iodin as an Astringent, Antiseptic, Disinfectant, and Germicide in Mouth Diseases 803
Lepkowski's New Root-canal Treatment with Sodium Subchlorid and Caustic Soda 692
Local and General Treatment of Serious Cases of Pericementitis Accompanied by Suppuration (Pyorrhea Alveolaris) 1413
Local Anesthesia (Quinin) 1413
Magnalium in Dental Technics 373
Making a Wax Model for a Hollow Inlay 610
Massage of the Gingivæ and Jaws 1040
Method for Exact Retention of Arsenous Dressings Without Pressure 1169
Method of Repairing a Shell Crown ... 608
Methodical Use of Arsenous Acid in the Painless Devitalization of the Pulp 496
Microscopic Investigations on the Eruption of the Permanent Teeth and the Resorption of the Deciduous Teeth .. 115
Mouth-breathing 805
Nature and Effect of Pyocyanase and Its Application in Dentistry 806
New (A) Interdental Splint 108
New Method of Diagnosing Dead Teeth Causing Fistulas 935
New Method of Repairing Bridges 1308
Non-cohesive Gold Fillings 609
Novocain and Its Applications in Dentistry 1169
Novocain as a Local Anesthetic in Dental Practice 1169
One Case of Fused Teeth and One of Gemination 372
Operative Injuries in the Extraction of Third Molars 247
Oral Cavity of Maternity Nurses—a Dangerous Source of Infection for Their Patients 1165
Original Method for Casting Gold Inlays 246
Osteomyelitis of the Lower Jaw 110
Pathogenesis of Dental Root-cysts 112
Perhydrol in Dental Therapeutics 247
Pivot Teeth After Dental Trauma 933
Plaster and Plaster Impressions 372
Platinum Base for Full Dentures 608
Practical Hints for the Making of Gold and Other Dentures 107
Preliminary Note on the Eruption of the Teeth 113
Problem (The) of Mouth-washes 1411
Progressive Destruction of the Teeth Sockets: Chronic General Periodontitis (Pyorrhea Alveolaris, Alveolar Osteitis, Interstitial Gingivitis) ... 1303

Prosthetic Treatment of Two Cases of Pyorrhea 1166
Public School Dental Clinic Movement (The) 694
Purification of Wax 609
Pyocyanase in Dentistry 806
Question of the Preservation of the Teeth in Osteomyelitis of the Jaws 1309
Relation of Modern Dentistry to the Tuberculosis Problem 1411
Removal of Adamantinoma (Cystoma) of the Mandible 113
Removal of Pulps 609
Removing Wax Impressions for Inlays Without Distortion 608
Repair of Perforated Gold Crowns with Cast Hollow Gold Inlays 1037
Report of a Case of Extreme Malocclusion with Description of the Measures Taken for Its Relief 698
Researches on the Development of Secondary Dentin 931
Restoration of Interproximal Spaces .. 610
Results of Histological Investigations of the Apex of the Root After Treatment of the Root-canal 604
Rhachitic Changes in the Dentin 805
Secondary Caries from Lactic Ferment Medication 694
(I) Seventy-five Cases of Trifacial Neuralgia Treated by Deep Injections of Alcohol. (II) Treatment of Trigeminal Neuralgia 244
Significance of Respiration as Affecting the Position of the Teeth 1164
Significance of the Sulfocyanates in Human Saliva 1167
Silver Nitrate Spots 1040
Simplified Gold Fillings 246
Soldering Fluid and Soldering Agent Substitute 609
Soldering Paste 608
Soldering of Gold, and the Causes of Checking of Soldered Porcelain Facings 696
Some Experiments on the Relative Susceptibility of Different Teeth to Dental Caries 1306
Some New Local Anesthetics, Replacing Cocain: a Critical Review 1169
Some Observations on the Bacteriology of Pyorrhea Alveolaris, and the Treatment of the Disease by Bacterial Vaccines 495
Spontaneous Death of the Pulp Without Caries, Due to Grippe 1309
Sterilizable Film-holder (A) 1036
Surgical Management of Complicated Hare-lip and Cleft Palate 494
Surgical Treatment of Certain Deformities of the Jaw Associated with Malocclusion of the Teeth 108
Syphilitic and Cancerous Manifestations of the Oral Cavity 1409
Teeth (The) and Alveolar Processes as Points of Entrance for the Tubercle Bacillus 1412
Treatment of an Epulis with Arsenous Acid 1039
Treatment of Discolored Teeth 932
Treatment of Oral Disease during Pregnancy 1306
Treatment of Paradental Cysts by Cauterization with Creasote 499
Treatment of Pulp Residues in the Conservative Treatment of Teeth 1165
Treatment of Wounds After Extractions 1408
Trifacial Neuralgia 114
Use for Vulcanite Scraps 610
Vaccine Treatment of Pyorrhea Alveolaris (Alveolar Osteitis) 497
Vibratory Massage in Dentistry 1408
Vincent's Angina 692
Vulcanizer Alarm 610

PERISCOPE.

Action of Hydrogen Sulfid Gas on Corrosive Sublimate 1414
Advancing the Jaw in Cleft-palate Cases 117
Advantages of the Gradual Administration of Anesthetics 701
Alcohol and Dental Caries 939
Amalgam and Oxyphosphate Cement Fillings 700
"Amberline" (Dr. Flagg) for Retarding Caries and Reducing the Hypersensitivity of Dentin 120

Anchorage in Cast Gold Inlays 1044
Anchorage in Regulating, and Its Different Forms 811
Annealing Broaches 118
Antiseptic Value of Soaps 1170
Arsenous Acid *versus* Arsenic Acid in Devitalizing the Pulp 1171
Asymmetry of the Hard Palate 1311
Base for a Richmond Crown 1044
Bleaching Teeth with Pyrozone and Sodium Dioxid 701
Breaking of Contraction or Expansion Arches 117
Brush (A) for Collecting Mercury.... 1414
Burning of the Gums Under a Gold Plate 937
Canada Balsam for Cavity Lining 1042
Care of the Mouth in Diabetes Mellitus 377
Cast Aluminum Plates 812
Cast Inlays with Pins 1170
Casting Against Metal Parts 699
Casting Aluminum Splints for Fractures of the Mandible 1415
Cheap and Efficient Dentifrice (A) ... 1170
Choice of Filling Materials 938
Chronic Suppuration of the Maxillary Antrum 377
Cleaning a Cement Mixing Slab 1042
Cleaning Burs 938
Cold Water Before Taking an Impression for an Artificial Denture 809
Collapse from Hemorrhage 1310
Consequence of Reckless Extraction of First Molars 1414
Constitutional Treatment in Pyorrhea 119
Constructing a Diet 700
Controlling Shrinkage in Porcelain Inlays 1042
Copper Matrix in Inserting Amalgam Fillings 702
Corrosion of Steel Caused by Paper ... 1313
Crowns or Bridges Without Casting Against the Porcelain 249
Cutting Aluminum 808
Dangers of Hasty Setting of Narrow Saddle Bridges 1417
Dangers of Potassium Cyanid 1171
Davis Crown with Cast Gold Base 938
Defective Teeth and Gastro-intestinal Diseases 702
Dental Care of Children During First Dentition 700
Dental Cysts 377
Dental *versus* Medical Requirements .. 501
Dermatol for Pyorrhea Alveolaris 609
Differential Diagnosis of Syphilitic Mucous Patches from Other Affections of the Mouth 808
Dressing After Removal of the Maxilla 249
Effects of Chronic Nasal Obstruction during Childhood upon the Growth of the Teeth and Jaws 1045, 1173
Empyema of the Antrum of Highmore 377
Faradic Current (The) in Dental Diagnosis 1312
Filling Operations in Children 702
Final Finish (The) of Gold Fillings .. 1416
Final Finishing of Cast Gold Inlays .. 809
Fitting Inlays to Place 249
Flies in Dental Offices 1414
Formalin and Adrenalin Chlorid in the Treatment of Hypersensitive Dentin 118
Fusible Metal (A) 1043
Galvano-cautery for Sterilizing Root-canals 251
General Treatment for All Cases of Acute Alveolar Abscess or Painful Eruption of Third Molars 1043
Gold and Platinum *versus* German Silver in Orthodontia Appliances 701
Gold Crown for Bridge Abutment on a Sensitive Tooth 1311
Gold Shell Bicuspid Crown with Steele Facing 1312
Gold Solder 377
Good Sprue Wire (A) for Inlays 117
Grinding Gum Sections 1313
Gutta-percha as an Insoluble Seal for Margins of Inlays 250
Hand Instruments in Cavity Preparation for Inlays 1171
Hemorrhage After Extirpation of the Pulp 1170
Hemostasis Without Medication 608
Hints for Using Sandpapr Disks 1416
Hints on Vulcanizing 120
How to Avoid Irritation from Tincture of Iodin 1172
How to Bring Out Rubber Plates with a Smooth Surface on Both Sides 500
How to Cement Bands, Especially in Retention Appliances 1171
How to Determine the Shade of an Artificial Tooth 937
How to Harden Plaster 249
How to Hasten the Shedding of Deciduous Teeth 608

How to Impart a Brilliant Black Color to Old Instruments 1042
How to Make an Anatomically Correct Gold Crown 811
How to Make Chloro-percha for Lubricating Root-canals 700
How to Make Tight Wire Ligatures ... 1171
How to Overcome the Brittleness of Gold in Casting 608
How to Prevent Excessive Brilliancy in Porcelain Inlays 1171
How to Prevent Rust 1171
How to Remove Hardened Modeling Compound from Impression Trays .. 501
How to Remove Silver Nitrate Stains 1310
How to Remove Steele's or Brewster's Facings from a Bridge Out of the Mouth 377
How to Tighten a Vulcanizer 250
Hygiene of the Mouth 811
Identification of Criminals by the Teeth 501
Importance of Preservation of the Pulp 250
Importance of Smooth Surfaces on Approximal Fillings 1414
Improved Chip-blower (An) 1173
Indications for the Expansion of the Maxilla 121
Individual Inlays *versus* Abutment Inlays 1415
Influence of Cement upon the Color of a Porcelain Inlay 1311
Inlays as Abutments 119
Insulating Cement 608
Investing the Wax Model in Casting.. 1414
Leukoplakia and Its Dangers 812
Lime-water as a Mouth-wash 117
Local Treatment of Leucoplakia..... 1417
Making a Wax Model for a Hollow Inlay 610
Matrix Formation for Simple Approximal Cavities 1173
Matrix Preparation for Porcelain Inlays 809
Maxillary Sinusitis 1311
Melting and Casting Aluminum by the Bucket Method 1174
Method of Holding a Crown While Polishing 937
Method of Making a Porcelain Crown Fit Perfectly 1415
Method of Repairing a Shell Crown ... 608
Method of Treating Superficial Softening and Erosion at the Junction of the Enamel and Cementum 1175
Method (Very Simple) of Casting Small Bridges 939
Molar Clamp Band 809
Mouth-Disinfection and Diphtheria ... 1043
Mouth-props in Anesthetizing Patients with V-shaped Maxillæ 1415
Mouth-washes 378
Necessity of a Collection of Models in Orthodontia 1044
Nervousness and Insanity Caused by Painless Dental Disease 251
Non-cohesive Gold Fillings 609
Number of Visits Necessary in Orthodontia Treatment 1172
Opsonic Therapy (Vaccine Treatment) in Pyorrhea Alveolaris 701
Oral Hygiene and Tuberculosis 1172
Oral Sepsis and Tetanus 249
Pain After Extraction 250
Painless and Bloodless Tonsillectomy with Descriptive Technique 938
Painting Smokers' Artificial Teeth 1171
Paraffin in Gasoline as a Separating Fluid 808
Paraform in the Treatment of Sensitive Dentin 118
Pigmentation of the Buccal Mucosa in Anemia 1310
Pin-locked Cast Gold Inlays in Abutments 810
Phenol as a Dental Disinfectant and Mouth-wash 1313
Platinum Base for Full Denture 608
Points in Casting Pure Aluminum Plates 809
Points in High-pressure Anesthesia ... 809
Points in the Selection of Disinfecting Methods 1416
Polishing Metals 249
Polishing Silicate Cement Fillings 1416
Porte-Polisher for Holding Orangewood Points 1045
Precautions in Inserting Temporary Stopping 1310
Preparation of Cavities Involving the Incisal Edge 1173
Preserving Dental Cements 809
Preventing the Hardening of Rubber .. 117
Preventing the Rubber Dam Holder from Marking the Patient's Face .. 1310
Prevention of Arsenical Poisoning in Pulp Devitalization 500
Prevention of Hemorrhage in Hemophiliacs 500

Prevention of Leakage in the Rubber Dam 501
Prophylaxis of the Oral Mucosa 1415
Pure Carbolic Acid *versus* Silver Nitrate in Open Ulcers About the Mouth ... 1417
Purification of Wax 609
Quick Method of Repairing Fractured Rubber Plates 120
Quick Repair of Rubber Dentures 378
Quinin and Urea Hydrochlorate as a Local Anesthetic 1310
Refitting Upper Plates 1172
Regulating Extremely Constricted Upper Dental Arches by Stationary Anchorage 808
Removal of Amalgam Fillings 500
Removal of Impacted Third Molars ... 1416
Removal of Pulps 609
Removal of Stains from Teeth 699
Removal of the Rubber Dam After Filling Operations 1414
Removing Glass Stoppers from Bottles 501
Removing Wax Impressions for Inlays Without Distortion 608
Removing Wax Models and Pins Together in Cast Gold Inlays 703
Replacing a Broken Crown or Bridge Tooth 249
Replacing a Broken Tooth in a Fixed Bridge 1042
Repolishing Artificial Teeth After Grinding 117
Restoration of Interproximal Space, 610, 938
Retaining Appliances in Orthodontia . 1045
Retention of Porcelain Inlays 1171
Rubber Dam in Difficult Cases 250
Salivary Examination for Potassium Sulfocyanate 119
Sensitiveness of Devitalized Teeth in Pyorrhea Alveolaris 701
Separation Preliminary to Applying Clamp Bands in Orthodontia 1173
Setting All-porcelain Crowns 120
Setting Gold Inlays 810
Shade Guide in Enamel Inlay Work .. 1174
Sharpening Files 118
Short Cut in Rubber Repairs 1311
Silver Wire After Resection of Portion of Mandible 376
Simple Device for Preventing the Contamination of Sterile Solutions 1312
Simple Method of Repairing a Broken Logan Crown 1171
Simple Splint for Fracture of Lower Jaw 118
Simultaneous Use of Expansion Arch and Clamp Bands in Regulating Teeth 1310
Sinusitis in Complication with Influenza 938
Soldering Aluminum 1175
Soldering Fluid and Soldering Agent Substitute 609
Soldering Paste 608
Solution for Local Anesthesia 937
Solvents for Rubber and Celluloid 1415
Some Difficulties in Casting Zinc Dies and How to Overcome Them 703
Sterilization of Aqueous Solutions of Chlorhydrate of Cocain 938
Stress on Abutment Crowns and How to Cope with It 1416
Successful Treatment of Chronic Alveolar Abscesses and Sinuses of the Jaws 699
Suction Plate for a Lower Denture ... 703
Syndrome from Non-eruption of Teeth 810
Taking the Bite in Edentulous Cases .. 117
Tannic Acid for Neuralgic Pains Due to Pyorrhea Alveolaris 117
Temporary Relief of Toothache 249
Tetanus from Infection of Cavity of Tooth 808
Treatment of Alveolar Abscess in Deciduous Teeth 810
Treatment of Cocain Poisoning 1310
Treatment of Empyema of Maxillary Antrum 501
Treatment of Fetid Breath 1172
Treatment of Gingivitis in Pregnant Women 1172
Treatment of Metallic Stains 1043
Treatment of Oral Inflammations 1043
Uniformly Good Investment Materials for Casting 1043
Usable Gold Plate from Gold Filings 939
Use of Vulcanite Scraps 610
Vulcanizer Alarm 610
Wax-Carving Pencils made of Waste Investment 1045
Wiring and Re-swaging a Gold Plate 939

HINTS, QUERIES, AND COMMENTS.

Congenital Deformity of the Mouth .. 812
Continuous Gum Denture (The) 252
Difficult Cases in Excessive Jaw-absorption 1046
Ideal Crown (An) for Anterior Teeth 379
Instrument for Adjusting the Facing to a Richmond Crown in the Mouth and for Setting Crowns with Gutta-percha 1418
Keeping Impression Trays Clean 503
Method of Hardening a Plaster Cast .. 940
Method of Removing a Wax Model for a Gold Inlay from the Cavity Without Distorting 1046
New Method for Taking Impressions .. 502
Original Method of Casting Seamless Gold Dummies 704
Perfect Teeth Preserved to a Great Age 1047
Porcelain Crown Work 705
Practical Method (A) of Thermo-cautery 252

OBITUARY.

Alexander, Amzi W. 503
Brockway, Albert H. 941
Brower, E. D. 1314
Collier, A. J. 126
Cornish, Mary R. R. 253
Crawford, James Young 611
Curtis, James W. 705
Darby, Chas. Hammond 813
Davis, Chas. E. 126
Decker, Wm. 942
Firman, Chas. H. 941
Gray, Joseph P. 1313
Hall, Ernest L. 125
Ibbotson, Edward B. 1178
Jackson, W. Heman 125
Jewett, Henry R. 122
Jones, Thomas J. 125
Keefe, Dennis Frank 379, 504
Knepper, Germanus 124
Loomis, Wm. H. 123
Maloney, James H. 1418
Mead, Wm. B. 1050
Moody, Joseph D. 123
Newton, Wm. Judson 1177
Rich, John B. 1176
Rohland, C. B. 1049
Smith, Mr. Edward J. 126
Straight, Milton B. 940
Taylor, Lucy B. 1315
Todd, Wm. H. 1047
Wilkerson, Basil Manly 1176

Brief Necrology—127, 253, 380, 504, 706 1050, 1178, 1315, 1419

DENTAL COLLEGE COMMENCEMENTS.

Atlanta Dental College 820
Baltimore College of Dental Surgery .. 708
Baltimore Medical College, Dental Department 817
Barnes Dental College 819
Birmingham Dental College 945
Chicago College of Dental Surgery 821
Cincinnati College of Dental Surgery .. 708
College of Dental and Oral Surgery of New York 823
College of Physicians and Surgeons of San Francisco, Dental Department .. 818
Colorado College of Dental Surgery ... 819
Creighton Dental College 815
Drake University, College of Dentistry 943
Georgetown University Dental Department 823
George Washington University, Dental Department 945
Harvard University Dental School 946
Howard University, Dental Department 822
Indiana Dental College 826
Kansas City Dental College 708
Lincoln Dental College 822
Louisville College of Dentistry 817
McGill University, Dental Department 825
Marquette University, Department of Dentistry 818
Medical College of Virginia, Dental Department 815

Medico-Chirurgical College, Dental Department 823
Meharry Dental College 707
New Orleans College of Dentistry 944
New York College of Dentistry 824
North Pacific Dental College 822
Northwestern University, Dental Department 942
Ohio College of Dental Surgery 815
Philadelphia Dental College (Temple University) 824
Royal College of Dental Surgeons of Ontario 707
St. Louis Dental College 821
Southern Dental College 709
Starling-Ohio Medical College 710
State Dental College, Texas 943
State University of Iowa, College of Dentistry 825
Texas Dental College 818
Tufts College Dental School 944
University College of Medicine, Dental Department 819
University of Buffalo, Department of Dentistry 822
University of California, College of Dentistry 819
University of Illinois, College of Dentistry 943
University of Maryland, Dental Department 820
University of Memphis, College of Dental Surgery 817
University of Michigan, Dental Department 945
University of Minnesota, College of Dentistry 826
University of Pennsylvania, School of Dentistry 816
University of Pittsburg, School of Dentistry 944
University of Southern California, Dental Department 943
Vanderbilt University, Department of Dentistry 709
Washington University Dental School . 825
Western Dental College 818
Western Reserve University, Dental School 946
Wisconsin College of Physicians and Surgeons, Dental Department 945

DENTAL SOCIETY NOTES AND ANNOUNCEMENTS.

Aberdeen (S. D.) District Dental Society 256
Alabama Board of Examiners 386
Alabama Dental Association 510
American Circulating Dental Clinic .. 254
American Dental Society of Europe ... 256
American Medical Association, Section on Stomatology 617
American Miller Memorial 711
Arizona Board of Examiners 260, 1183
Arkansas Board of Examiners 625
Army Dental Corps, 132, 258, 388, 516, 628 728, 840, 947, 1052, 1184, 1320, 1424
Atlanta Dental College Alumni Association 618
California State Dental Association ... 385
Canadian and Ontario Dental Association 511
Celebration in Honor of Dr. G. V. Black 128
Chicago Odontographic Society 514
Connecticut Dental Commissioners 625, 1183
Connecticut State Dental Association .. 383
Delta Sigma Delta Fraternity 617
Dental Board of New South Wales ... 723
Dental Council of New South Wales .. 1421
Dental Faculties Association of American Universities 719
Dental Hygiene Council of New York City 613
Dental Index Bureau 129, 1316
District of Columbia Board of Examiners 131, 725, 1423
Eastern Indiana Dental Association ... 383
Examination for Dental Surgeons, U. S. Army 259
First and Second Districts Dental Society of Louisiana 513
Florida Board of Examiners 626
Florida State Dental Society 719
Georgia State Dental Society 513
G. V. Black Dental Club of St. Paul 128, 1318
Hartford Dental Society, Memorial to Dr. Horace H. Hayden 946
Harvard Dental Alumni Association ... 948
Hawaii Board of Examiners 131, 839
Illinois Board of Examiners 515, 1182
Illinois Civil Service Commission 259

Illinois State Dental Society 256, 838
Indiana Board of Examiners 131, 626
Indiana State Dental Association 257
Iowa Board of Examiners 132, 625
Iowa State Dental Society 131
Kansas Board of Examiners 723
Kansas State Dental Association 384
Kentucky State Dental Association ... 384
Lake Erie (Pa.) Dental Association ... 384
Lebanon Valley (Pa.) Dental Association 619
Louisiana State Dental Society 257
Luzerne and Lackawanna Dental Society 386
Maine Board of Examiners 627
Maine Dental Society 385
Marquette University, Dental Department 131, 1422
Maryland Board of Examiners 514, 1183
Massachusetts Board of Registration, 260, 625, 1182
Massachusetts Dental Society 257
Michigan Board of Examiners 386, 1183
Michigan State Dental Society 513
Minnesota Board of Examiners 260, 625, 1183
Mississippi Dental Association ...131, 511
Mississippi Dental Examiners 624
Missouri State Dental Association 511
Montana Board of Examiners 726
Montana State Dental Society 620
National Association of Dental Examininers 128
National Association of Dental Faculties 509
National Dental Association, 381, 614, 712, 715, 829, 1421
National Dental Association, Southern Branch and Texas State Dental Association 129, 256
National Institute of Dental Pedagogics 1422
Nebraska Board of Examiners 515, 1318
Netherlands—New Dental Society 129
New Hampshire and Vermont Dental Societies 131
New Hampshire Board of Registration 514, 1051
New Jersey Board of Registration 259, 1184
New Jersey State Dental Society 513
New Mexico Dental Society 722
New York Alumni Association of Xi Psi Phi Fraternity 509
New York State Dental Society 619
Ninth District (N. Y.) Dental Society 623
North Carolina Board of Examiners .. 516
North Carolina Dental Society 385
North Dakota Dental Association 620
North Philadelphia Association of Dental Surgeons 1181
Northeastern Dental Association 1051
Northern Illinois Dental Society 1179
Northern Indiana Dental Society 1179
Northern Ohio Dental Association 512
Northwest Missouri Dental Club 257
Odontographic Society of West Philadelphia 258, 1317
Odontological Society of Chicago 131
Odontological Society of New Orleans . 258
Odontological Society of Western Pennsylvania 383
Ohio State Dental Board 627
Ohio State Dental Society 1317, 1422
Ohio Miller Memorial Committee 623
Pennsylvania Board of Examiners .626, 1319
Pennsylvania State Dental Society 257
Psi Omega Fraternity 509
Reading (Pa.) Dental Society 257
Rhode Island Board of Registration 627, 1320
Rotterdam Dental Society 255
St. Louis Society of Dental Science ... 258
Second District (N. Y.) Dental Society 1421
Seventh and Eighth District (N. Y.) Dental Societies 1318
South Carolina Board of Examiners .. 627
South Carolina State Dental Society .. 622
South Dakota Board of Examiners 131, 627, 1424
South Dakota State Dental Society ... 621
Southern California Dental Association 512
Southern Illinois Dental Society 1051
Southern Minnesota Dental Society .. 383
Southern Wisconsin Dental Association 622
Southwestern Michigan Dental Society 383
Southwestern Nebraska Dental Society 383, 1318
State University of Iowa, Alumni Dental Association 383
Susquehanna Dental Association of Pennsylvania 510
Tennessee State Dental Association ... 619
Texas Board of Examiners 387, 1423
Truman Dinner (The) 130
University of California, Dental Department 619, 1317
University of Illinois, College of Dentistry 385
Utah Board of Examiners 1320

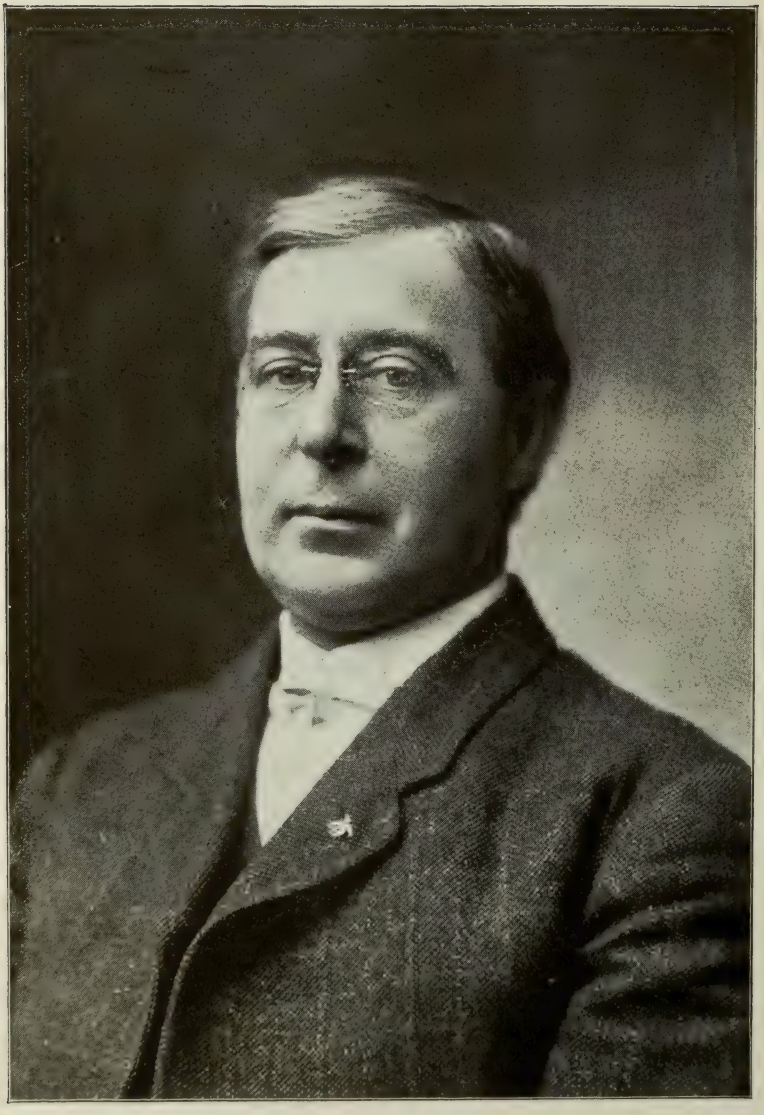
Vermont and New Hampshire Dental Societies 131
Vermont Board of Examiners 726
Vermont State Dental Society 948
Virginia Board of Examiners 627
Virginia State Dental Association 257
Washington Board of Examiners 514
W. D. Miller Club of Pittsburg 711
West Virginia Board of Examiners ... 386
Wisconsin Board of Examiners 625, 1423
Wisconsin State Dental Society 513
Wyoming Board of Examiners 726
Xi Psi Phi Fraternity, New York Alumni Association 1051

Monthly Record of Patents Relating to Dentistry.

PATENTS 132, 260, 388, 516, 628, 728, 840, 948, 1052, 1184, 1320, 1424

INDEX.

INDEX TO VOLUME LII 1425



DR. H. R. JEWETT.

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ORIGINAL COMMUNICATIONS.

THE PROBLEM OF ARTICULATION.*

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(I.)

CHAPTER I.—HISTORICAL SYNOPSIS.

THE problem of articulation is, in my opinion, not completely solved, even though we may know all the movements of the mandible theoretically, until these movements can be exactly imitated mechanically, and then not only for an average normal case but for each individual one.

How far I have succeeded in doing this, the examination of this work and the practice of its principles will show.

It is now over forty years since Dr. Bonwill, at a meeting of the American Dental Association, presented his anatomical articulator. His work is, I take for granted, so well known that I need only mention the further progress that has been made on the basis of his system.

No comments are necessary on the plain, hinged articulators, with only an up-and-down movement of opening and closing, which were in use formerly, and which unfortunately are still used by a large majority of practitioners.

Why is it that Bonwill's pioneer work has been so little appreciated and utilized, and that so many practitioners fall back on the old hinged articulator? It is because those who have taken the time and trouble to try his methods found out very quickly that artificial dentures did not articulate as well in the

* A translation of Professor Gysi's book, "Beitrag zum Articulationsproblem," published by Hirschwald, Berlin, in 1908, with some practical additions written since its publication.

mouth as they did in the articulator in which they were constructed. Though many had these bad practical results, there were very few who were able to improve on his principles.

Some few, however, who were unsuccessful with his methods, looked for the cause, and several practitioners—namely, Walker (1896), Schwarze (1900), and Christensen (1902)—found that the condyle path does not run horizontally, as represented by the joint mechanism of the Bonwill articulator, but slopes forward and downward. This fact had previously been noted by two anatomists—Luce of Boston (1889) and Count Spee (1890)—but their work remained unknown to dentists for some years.

Since 1894 I have endeavored to construct an articulator with an oblique downward movement. In the years 1896 to 1899 I constructed, together with Dr. Eugene Müller of Zurich, an articulator which was made to imitate exactly the form of the condyle and the glenoid fossa. The result of our labors we reported at the annual meeting of Swiss dentists held in Lucerne in 1899. (See *Schweizerische Vierteljahrsschrift für Zahnheilkunde,* July 1899.)

Our condyle articulator, however, gave good results only when used for an average normal case, but proved to be more or less a failure in all abnormal cases. This instrument, therefore, was never introduced commercially.

After many efforts Schwarze also succeeded in constructing an articulator with a forward and downward movement. Christensen says, in the *Correspondenzblatt,* January 1902, in reference to this articulator, that Schwarze had designed an articulator with the aid of an excellent and simple construction of a vertical and horizontal spring joint, which reproduced every natural movement of the mandible, and had so far solved the problem; but as this spring joint had no fixed path guides, this articulator was serviceable only when some natural teeth were left to guide the movements, but was of no value when such guiding teeth were missing.

Schwarze constructed several other articulators on more or less the same principle.

Walker was the first to construct an apparatus with which to measure the individual inclination of the condyle path (Dental Cosmos, October 1897). He was also successful to some extent in constructing an articulator with which to reproduce the movements recorded by this apparatus, but his measuring instrument and articulator were so exceedingly complicated and expensive that they were never commercially introduced, there being no demand for them.

In the year 1901 I was able to construct a simplified apparatus for measuring the slant of the condyle path to the occlusal plane of the teeth—that is, the path of the condyle points of Bonwill's triangle in a vertical plane. (See Fig. 1, *G.*) Furthermore, by the help of a simple method, I was the first who was able to register in individual cases the path of the incisor point of the triangle in a horizontal plane. (See Fig. 1, *S.*) This was the easiest part of the whole problem, but it took seven years to make an articulator with which to imitate these movements. During that time I constructed seven different models of articulators, but did not care to publish my theories until I knew how to make practical use of them.

In the meantime, Parfitt and Constant (England) were successful in registering the movements of the condyle points of the triangle in individual cases, and in imitating these movements in an articulator.

The Parfitt articulator is certainly unique in its simplicity, but it does not reproduce the natural movement of the mandible in regard to the incisor point of Bonwill's triangle. The Constant articulator I have unfortunately never seen.

The simplest method of determining the slant of the condyle path was discovered by Christensen in 1902; simplest because he did not use any measuring apparatus. Having secured the relative positions of the models in normal occlusion by taking the bite in the usual manner and fixing the models in the articulator, some soft wax was added in the

molar region of the bite plates, and the bite was taken again with the mandible in a protruding position. The bite plates were again placed in the articulator and the sliding joint was adjusted to allow this protruding movement, thus fixing the slant of the condyle path.

This method, in spite of its ingenious simplicity, had the disadvantage that an extra sitting was necessary to measure the slant of the condyle path, while with my method this can be done at once when the bite is taken.

On the whole, Christensen's articulator, aside from some shortcomings of which I shall speak later, is constructed on correct principles, and allows an imitation of the chief masticatory movements of the mandible. It lacks sufficient stability, inasmuch as, besides the fairly correct movements, it permits of other movements which are uncontrollable, just as did the articulators of Bonwill, Walker, and Parfitt.

Christensen's as well as Walker's method of measuring the inclination of the condyle path is quite incorrect in cases where the condyle path does not form a straight line but follows a more or less curved line or an S-shaped curve, as it most frequently does according to my measurements.

In the beginning of this latter curve the condyle path is more or less horizontal; then, as the condyle moves forward on the eminentia articularis, it takes a sharp downward turn, and toward the end is more or less horizontal.

Both of these methods—Christensen's and Walker's—register only the direct line between the beginning and the end of the curve, but what lies between the beginning and the end cannot be imitated in these articulators. In this respect the Parfitt method is the better one, in that it admits of the registering of a curved path and its reproduction in the articulator.

It can be seen from these observations that each one of these meritorious investigators has made a valuable contribution to the great problem of articulation; but in the making of a handy, exact articulator they are all far from the ideal in the mechanical imitation. Why? First, because the investigator and the mechanician are rarely combined in one person, and second, because it is very difficult to train a mechanician to understand the various movements of the mandible so that he may reproduce them in an apparatus.

In the year 1901 Tomes and Dolamore published their excellent studies on the movements of the mandible. I shall not go into the details of their work, as these investigators considered only the opening and closing movements of the mandible, which have no direct influence on the setting-up of teeth for artificial dentures. Their researches, therefore, have only a theoretical value.

In the January 1905 issue of the Cosmos, Campion (England) published his studies on mandibular movements. As his registering apparatus had to be fastened to natural teeth present in the mandible, and these teeth were not always in normal position, he secured very curious tracings of the movement of the condyle path, probably owing to his asking the patients to execute extreme opening and lateral movements that in normal articulation do not occur.

In 1903 Michel took the same incorrect course that Müller and I had taken five years before, his so-called skull articulator being constructed by arranging a natural skull so that it could be used as an articulator.

In 1906 Peckert (Heidelberg) wrote a very good article on the inclined path of the condyle and its significance in the arranging of teeth for artificial dentures, to which reference will be made in the course of this treatise.

The interest taken in this subject in America during the last few years is shown by the construction of various new articulators, some of which I shall briefly mention.

A theoretically correct articulator was constructed by Kerr (patented 1902), theoretically correct because the axis of the movements of the articulator was on a line with the occlusal plane, or about the height of the inferior dental foramen. This articulator, like mine, has a

slotted plate which runs over a pin and can be arranged so as to produce the desired inclination. The opening and closing movement is independent of the condyle path, but in lateral movements does not combine properly with the joint movement, owing to the instability of the articulator. With plaster models or with finished artificial dentures this articulator works relatively correctly, but as long as the artificial teeth are set up in the more or less soft wax, it permits uncontrollable movements unless manipulated most carefully, because the certain and stable incisor guide (see Fig. 25, *St*) is lacking.*

For many cases the Kerr articulator is without doubt a fine instrument if carefully handled; it does not, however, allow enough individual movement, as it has only one condyle path form and only one balancing point.

The articulator of Antes-Lewis, like the Kerr articulator, has a slotted plate guide, the slant of which cannot be changed. The slant of this condyle path guide is less than what I found to be the average, so that in many cases the results are quite unsatisfactory.

The Gritman articulator is a very handy and stable instrument, with a slightly inclined condyle path guide in the shape of an unchangeable, fixed slotted plate.

In the July number 1907 of the *Oesterreichisch-Ungarische Vierteljahrsschrift für Zahnheilkunde,* Wallisch writes about an articulator, under the heading of "Ein Naturgetreuer Articulator." (A natural articulator.) In the same degree as the condyle path in the Gritman articulator slants too slightly, the slant in Wallisch's instrument is too steep. The joint of the articulator imitates the form and slant of a strongly inclined eminentia articularis. Wallisch's theoretical intention was to make an articulator which would prevent the wrong downward movement of the upper bow of the articulator in reproducing lateral movements which all other articulators had up to that time, but the mechanical construction was so faulty that these wrong movements could still occur; the movements in the incisor region, on the other hand, followed the same slant as the condyle path.

According to my investigations, as I shall demonstrate later, the eminentia articularis has a slant of from 5° to 45° to the occlusal plane; while in the incisor region the gliding angle registers 50° to 75°. It is therefore not possible for both to carry out the same slanting movement. Hence Wallisch's articulator does not deserve to be called a "natural articulator."

The longer we study the movements of the mandible, the more shall we be astonished at their infinite variety.

I cannot enter here into the normal anatomical relations of the mandible, and must take for granted that this part of this subject is sufficiently well known, but would recommend to those interested to read Wallisch's splendid article published in the *Oesterreichisch-Ungarische Vierteljahrsschrift,* April 1903, or Amoëdo's book on this subject.

Recently Schwarze has constructed a new articulator which is based on about the same principles as Christensen's, but is much simpler, and therefore signifies an important step forward in the construction of articulators.

In the October 1908 issue of the Dental Cosmos, Wilson writes of the latest articulator of Snow, "The New Century Articulator," and its auxiliary instruments "The Face Bow and Bite Guides." This articulator is, like Gritman's, a handy and simple instrument, and has a condyle path guide, the slant of which is fixed by the Christensen method. The "face bow" fixes the distance of the models in the articulator in correct relation to the joints, which is of great importance, as I shall demonstrate later in this treatise.

In the human jaws the most complicated conditions occur, the mandible moving up and down, forward and backward, right and left, presenting all sorts

*[Figs. 1-23 accompany the present instalment of Dr. Gysi's text. Those beyond Fig. 23 will be given in a subsequent issue.—Ed. Cosmos.]

of combinations of these three elementary movements. In addition to these an infinite variety of modifications is found in individuals, consisting in a more or less sharp slope of the front wall of the glenoid fossa, in more or less pronounced overbite of the incisors, and in varieties in the co-ordination of the muscles, so that the rotation point of the whole movement may lie sometimes on the outside and sometimes on the inside of the condyles. Finally, differences occurring in the same individual between the left and the right side must be considered, due to an uneven loss of teeth, which may for a long time necessitate one-sided and limited masticatory movements.

In preparing artificial dentures, especially for edentulous cases, it is of the greatest importance to determine any deviations from the normal. The idea of many writers that in making artificial dentures normal conditions should be imitated as closely as possible is wrong, because in an edentulous mouth normal relations no longer exist; first, as I have already mentioned, because of the uneven loss of teeth, and second, because of the uneven resorption of the alveolar ridges. It must also be taken into consideration that artificial teeth are not firmly attached to the jaws like the natural teeth. Christensen says correctly: "It is not sufficient that we here uncritically follow the supposed directions of nature, but we must attempt to solve the question by soberly considering the mechanical conditions which present themselves, and base our work on general mechanical (kinematic) principles." (Dental Cosmos, October 1905, vol. xlvii, p. 1186.)

Furthermore, we must keep in mind that even the most perfect articulator will not produce good results unless it is handled intelligently. The articulator must be considered only as a help in holding the artificial teeth, which in every case must be of the proper form and in the proper position, so that they will balance properly in the various masticatory movements.

In the following chapters I shall try to place before you the results of my investigations.

CHAPTER II.—Description of the Measuring Instruments Used in Determining the Elementary Movements of the Mandible in Every Individual Case.

According to Bonwill, the two condyles form an equilateral triangle with the contact point of the lower central incisors. I have therefore constructed two measuring instruments: With the one (Fig. 1, *G*), I determine, from the forward and opening movements and the combination of these two, the form and direction of the two condyle points of the triangle in a vertical plane; with the other instrument (Fig. 1, *S*), I determine, from the lateral movements, the path of the incisor point of the triangle in a horizontal plane.

From the registered paths of these three points of the triangle in their separate directions, I can direct the movement of the mandible in all the combinations of the masticatory movements.

THE LARGE REGISTER FOR DETERMINING THE SLANT OF THE CONDYLE PATH.

This instrument (see Fig. 1, *G*) serves to measure the path taken by the condyles in the movements of the mandible. The important part of this instrument consists of two lead pencils, which in every individual case can be placed in the region of the condyles. (Fig. 2.)

Its attachment to the mandible is accomplished through the horse-shoe plate (Fig. 1, *H*), which, with its points on the under side, is pressed into the lower wax model which has been used in taking the bite. (Fig. 4.) The whole is so well balanced and weighted that it will, without any further help, remain firmly in its position in the mouth.

Parallel to the horse-shoe plate (which we shall consider as being in place) on the wax model and on a line with the plane of occlusion (Fig. 30), parallel plates run backward on both sides (*P* in Fig. 30 and Fig. 2), carrying movable spring lead pencils in the region of the joint (*B* in Fig. 30 and Fig. 2). For extreme cases these lead-pencil hold-

ers may be changed from the left to the right side, or moved up and down on their vertical bars with a screw (Figs. 1 and 30), so that the pencil points form as nearly as possible a right angle to the writing surface of the recording card. (Fig. 2.) The parallel plates with the lead pencils may be adjusted for individual cases by moving the plates on the cross-bar which holds them (*T* in Figs. 2 and 30).

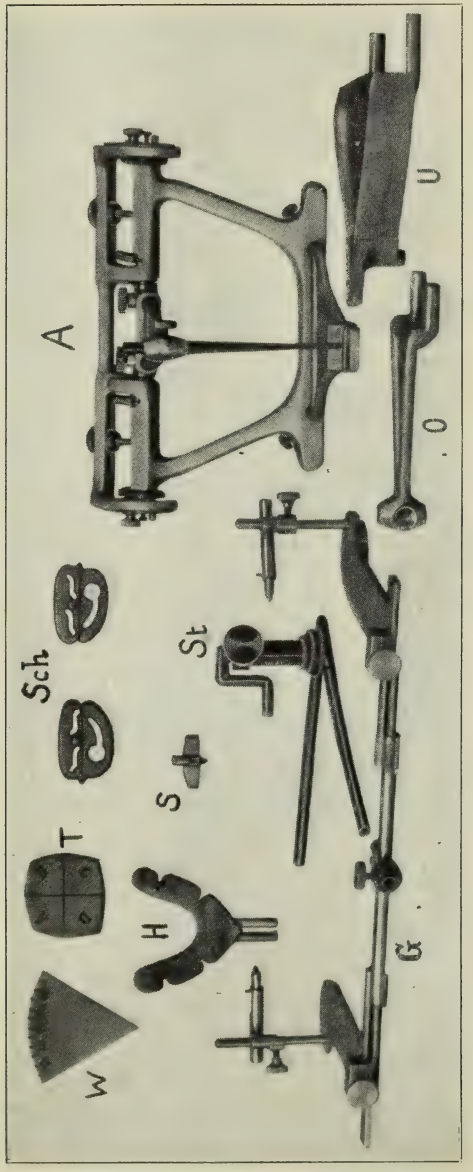


Fig. 1.

A, Articulator. *O*, *U*, Extra bows. *G*, Condyle path register. *H*, Horse-shoe plate. *Sch*, Extra pair of condyle path guides. *W*, Angle measure for condyle path slant. *T*, Type plate for molar groove. *St*, Holder for register *G* (to be used when plastering models to articulator).

This instrument also serves as a compass, like the American Snow face-bow, which fixes the distance of the plaster models in correct relation to the axis of the joints. (Fig. 30.)

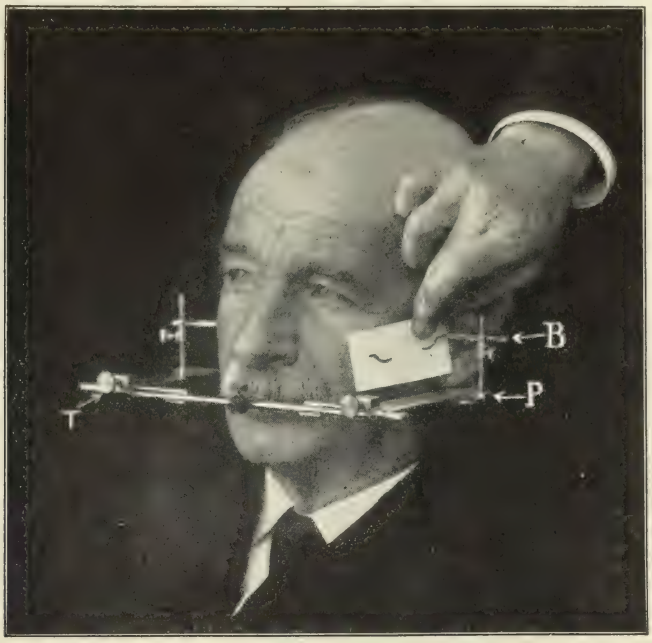
In order to find out the movements of the mandible in different individuals, the wax bite-plates are prepared in the usual manner, except that the base-plates must be either of modeling compound 1.5 mm. in thickness or of some other equally firm material reinforced in the usual way with a piece of wire. After proper attention has been paid to all the details, such as securing the proper fulness of the wax models to insure proper lip contour, the right height of the plane of occlusion, the length of the incisors, the median line of the face, etc., the patient is directed to open and close the mouth several times, during which the positions of the condyles are ascertained by feeling in the region of the ear where they move. Then the positions of the condyles in the resting position (with the mouth closed) are found, and marked on the surface of the skin of the patient with a pencil or with chalk. Usually the condyles are found about one centimeter in front of the tragus of the ear, in the direction of the outside corner of the eye. (Fig. 3.) The horse-shoe plate is then fastened by its points to the lower wax bite-plate and both are placed in the mouth.

If some natural teeth are left in the mandible, a horse-shoe plate without points can be used. Some hot modeling compound is placed on the under side of this plate and pressed over the teeth, just as though an impression were to be taken. In most cases where there are natural teeth it is not absolutely necessary to measure the relations of the joints.

The condyle path register is now attached to the horse-shoe plate, which in its position in the mouth is firmly fixed to the wax bite-plate. The lead pencils are put at the marked places which indicate the positions of the condyles; by adjusting them on their perpendicular bars and through the sliding arrangement on the cross-bar, they are brought close to the surface of the skin.

The form and slant of the condyle path will then be found by inserting a piece of cardboard, as shown in Fig. 2, between the pencil points and the skin in the region of the joint, with the lower edge parallel to the parallel plates of the register. The latter plates are again moved on the cross-bar until the pencils are brought in such close contact to the writing surface of the card that the springs holding the lead pencils are under a pressure. The patient is directed to move the mandible up and down, and from side to side (chiefly the latter motion), until the condyle path is clearly drawn on the surface of the recording card. (Fig. 2.)

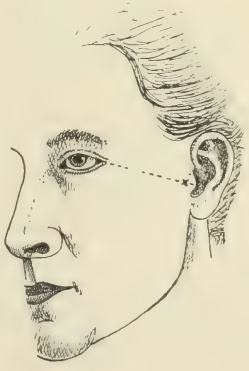
Fig. 2.



Shows the method of determining the slant and form of the condyle path.

The lateral movements of the mandible show that the curve first made by the opening and closing movements is followed in the lateral movements, and that while one condyle moves forward, the other moves more or less backward. (See

Fig. 3.

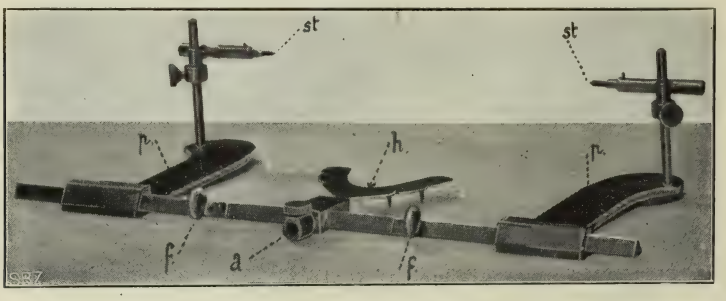


explanation to Fig. 9.) The measuring of this moving path of the mandible occupies hardly three minutes' time.

After one side of the mandible has thus been measured, the same card is held on the other side, and the same procedure is again followed. After the measuring is finished, the lead pencils are moved outward by the sliding arrangement on the cross-bar, so that the recording card and the register may be taken away, without, however, removing the horse-shoe plate. The lead pencils with their holders must not be moved or turned on their vertical bars, as their position is of importance in attaching the models to the articulator (Fig. 30), as we shall see later. The wax models may then be taken from the mouth.

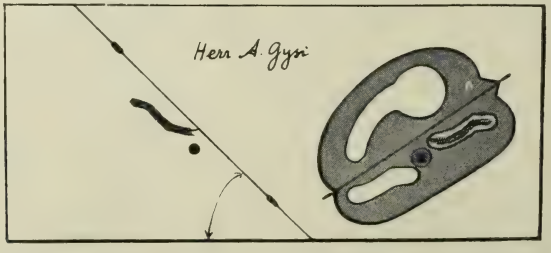
To find the angle of the registered path in relation to the occlusal plane, a slotted plate is selected which corresponds as nearly as possible to the form of the registered path. The plate chosen is placed directly over the lead-pencil drawing, so that the drawn line can be seen approximately parallel to the sides of one of the slots. (Fig. 5.) Press the point of the axis of the slotted plate through the card, and then mark the points of the long axis of the plate with a pencil. This will show the main direction of the condyle path is found by means of the slotted plate. (Fig. 5, left), which line is continued to the lower border of the card, so that with the angle measure one can determine (see Fig. 6) the acute angle which this line forms with the lower border of the card. As this lower border of the card is held (in

Fig. 4.



Shows the condyle register with the horse-shoe plate attached, to which the lower wax bite-plate is fastened. *st*, Spring lead pencils. *p*, Parallel plates. *h*, Horse-shoe plate. *f*, Finger rests. *a*, Place for inserting holder.

Fig. 5.



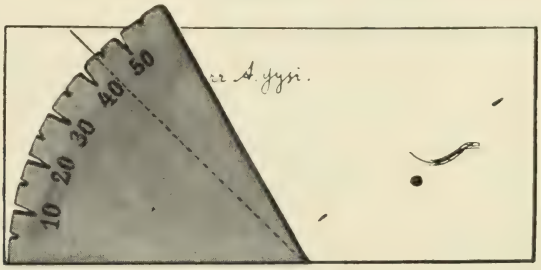
Shows how the main direction of the condyle path is found by means of the slotted plate.

the registering of the path of the condyles) parallel with the parallel plates, which in turn are parallel to the horseshoe plate, and this latter lies in the plane of occlusion (Fig. 30), the angle measured in this way must correspond

of which is 44° to the plane of occlusion (*P* in Fig. 2); on the left the measured angle registers 34°.

In cases where the curve is more or less horizontal, and the lengthened line does not reach the lower border of the

Fig. 6.



Shows the mode of measuring the angle formed by the condyle path and the lower border of the recording card.

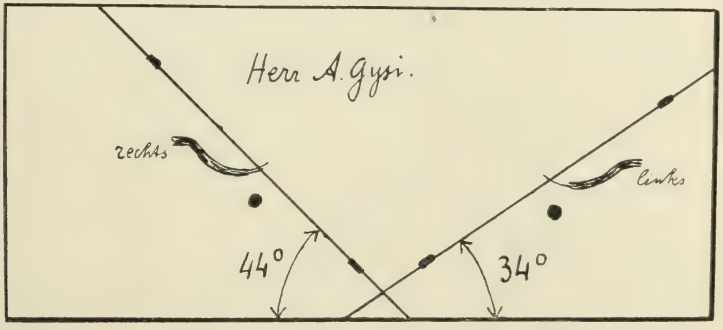
exactly with the slant of the path of the condyle to the plane of occlusion.

The slotted plate chosen is then placed in position on the articulator and the known slant fixed by means of the engraved degree scale on the joint of the

card, a line is drawn from the side of the card tangent to the lengthened line and parallel to the lower border of the card. (Fig. 8.)

The objection may be raised to my method of measuring that the plane of

Fig. 7.



Shows the completed measurements of the condyle path.

instrument. (See *W* in Fig. 25, also Fig. 27.) Then proceed in the same manner with the registered condyle path of the other side.

Fig. 7 shows a recording card with the registered condyle paths of the right and left sides, which have been measured in the manner stated. On the right side the condyle moves in a slant the angle

occlusion represented by the wax bite-plate is not a fixed point, because in setting up the artificial teeth one is obliged to change this temporary plane of occlusion according to circumstances.

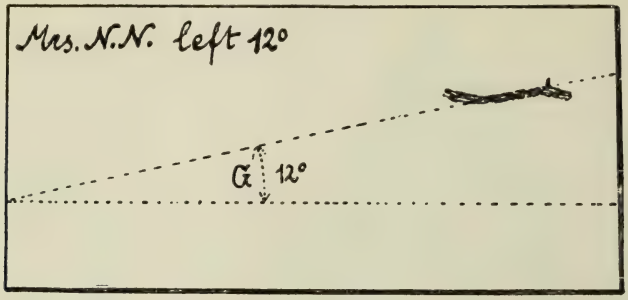
This objection, however, is only apparently justified, because in reality not only the angle of the condyle path to the temporary plane of occlusion is obtained,

but also at the same time that to the alveolar ridge, or to the mandible itself as a whole.

If the temporary plane of occlusion is changed, the degree of the angle of the condyle path is of course also changed to agree with the new plane of occlusion, but the relative relations of the position of the mandible itself to the condyle path remain just the same.

From the description of this diagram it can be seen that during the forward and downward movements of the one condyle, the other runs more or less backward horizontally.

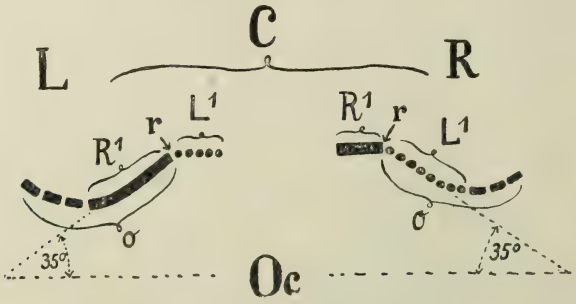
Fig. 8.



The extreme forward movement and the opening and closing movements may be divided into two parts: First, the path which the condyle takes in a slight lateral movement, and second, the path which the condyle takes in its movement on the eminentia articularis, which is more or less horizontal and finally may even lead upward.

As the last part of the path as represented by dashes in Fig. 9 can only occur in extreme lateral or wide opening

Fig. 9.



Analysis of a right and left condyle path as secured by method shown in Fig. 2. *C*, Condyle path. *L*, Left. *R*, Right. *Oc*, Plane of occlusion. 35°, Angle of middle part of path to plane of occlusion. *r*, Resting position of condyle. R^1, Path of condyle in a right lateral movement. L^1, The same in a left lateral movement. *o*, Forward bite or wide opening and closing movement.

I will now give an analysis in detail of a condyle path curve as illustrated in Figs. 5 and 7.

Fig. 9 shows an enlarged diagram of a left and right condyle path curve, each of which is divided into its chief parts, as indicated by the different lines.

movements, and is of no importance in mastication, I determine only the degree of the angle of the more important middle part of the curve to the plane of occlusion. (In the case represented in Fig. 9 the angle registers 35°.)

It does not often happen that both condyle path curves have the same form and slant. Some examples of the differences in form and slant between left and right condyle path curves in the same individual may be seen in Fig. 12, *a* to *i*. The specimens in the same figure from *m* to *q* show that other differences may occur, either in only one or in both joints at the same time, between the path of the opening movement and the path of the lateral movement (*n* to *q*). For practical purposes only the path taken in the lateral movement possesses any value in the setting up of the artificial teeth for effective mastication, and therefore only this angle is measured.

In Fig. 10 I have compiled a number of condyle path angles, and from these statistics it can be seen that the average angle is about 33°.

The accompanying table shows the same cases individually arranged, and it may be seen from it that in about half the cases there is a difference of only about 4° between the right and the left side. As this slight difference might be attributed to a possible mistake in measuring, it can be truly said that half the cases which I have measured had the same condyle path angle on both sides, and the other half showed a difference of between 5° and 22°, averaging about 10°. One astonishing case of exception showed 51° on the right side and 10° on the left, a difference of 41°.

Fig. 10.

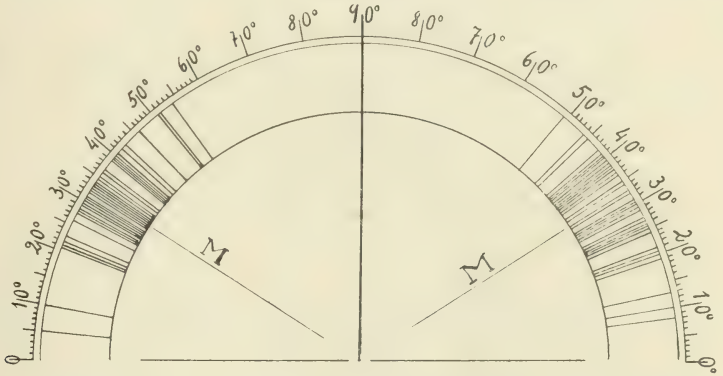


Diagram of a number of condyle path angles. (See table.)

Examples of Angles of the Condyle Path.

(Same cases individually arranged.)

Right.	Left.	Difference.	Right.	Left.	Difference.
54°	54°	0°	33°	38°	5°
40°	40°	0°	43°	38°	5°
33°	33°	0°	35°	30°	5°
51°	50°	1°	30°	25°	5°
26°	27°	1°	26°	20°	6°
39°	37°	2°	28°	20°	8°
28°	30°	2°	21°	13°	8°
23°	21°	2°	40°	32°	8°
35°	37°	2°	10°	19°	9°
40°	42°	2°	34°	25°	9°
32°	35°	3°	22°	31°	9°
31°	34°	3°	30°	40°	10°
33°	36°	3°	28°	39°	11°
37°	40°	3°	40°	25°	15°
5°	9°	4°	29°	45°	16°
36°	40°	4°	46°	29°	17°
10°	14°	4°	23°	45°	22°

Fig. 11 shows a collection of condyle path forms, from which I have chosen the four average types that are used in my articulator in the form of the slotted plates represented in Fig. 5. If necessary, other forms may be made from

thin brass plate. These slotted plates are the condyle path guides of the articulator.

THE SMALL REGISTER: INSTRUMENT FOR DETERMINING THE PATH OF MOTION OF THE ANTERIOR TRIANGLE POINT IN A HORIZONTAL PLANE.

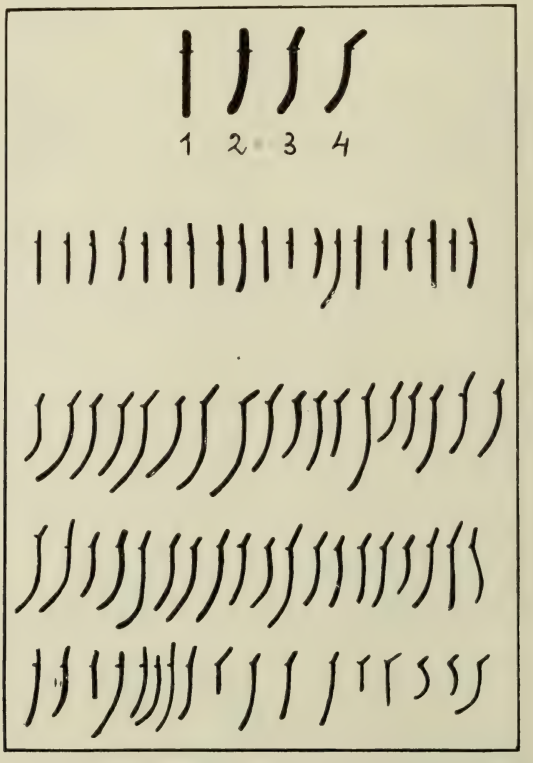
The movement of this point in a vertical plane in the opening and closing movement has, as has already been stated in the opening chapter, been measured by Tomes and Dolamore, but for practical purposes that has no value. Only the path in a horizontal plane, which varies from case to case, need be determined for our purposes, as this alone has an influence on the setting-up of artificial teeth.

To secure this, I proceed as follows: The shaded part of the horse-shoe plate, as shown in Fig. 14, is covered with a thin film of dark-colored wax, which with a hot instrument is spread to the thinness of paper.

A pointed marker (the small register) mounted on a spring is now pressed directly over the median line of the upper wax model after having been warmed slightly, and with a hot instrument is firmly attached at the edges. The point must stand out about one millimeter over the occluding surface of the wax model. (Fig. 13.)

The upper and lower wax models are again placed in the mouth and held in position by a little tragacanth powder, and the patient is requested to move the mandible from side to side. The point of the marker registers these movements on the coating of wax on the horse-shoe plate. At first these recorded movements

FIG. 11.



The four average forms of condyle paths. Examples of condyle path forms as registered in edentulous patients.

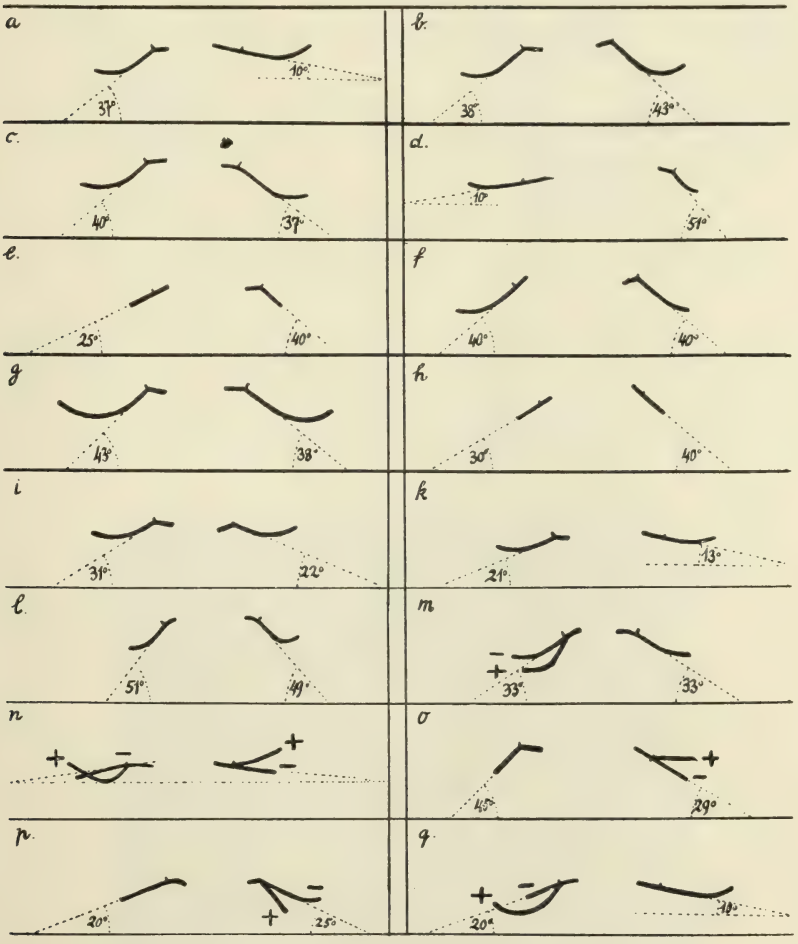
are somewhat irregular and intertwine at the posterior portion of the wax-covered part of the plate (K in Fig. 14), because in the beginning the patient pushes the mandible too far forward. Without an effort to correct this improper position of the mandible, this movement is allowed to continue, and it will be seen that the mandible, owing to fatigue, will gradually go back to its normal distal position, and its path will be recorded by a correct regular curve (K M K).

The outer line of these tangled markings is the normal path, the middle is the true median line and also the normal closing-point in the resting (occlusal) position of the mandible.

When the point of the marker is at M, Fig. 14, or in resting position (see Fig. 15), the usual marks are made on both wax models at the notches prepared in the horse-shoe plate (S S, Fig. 14) to show the proper position of the models when being fastened with plaster to the articulator.

This instrument is of great service in the use of any articulator, because, leaving aside its special purpose, which will be explained later, it is an excellent help in securing the normal resting position of the mandible.

FIG. 12.



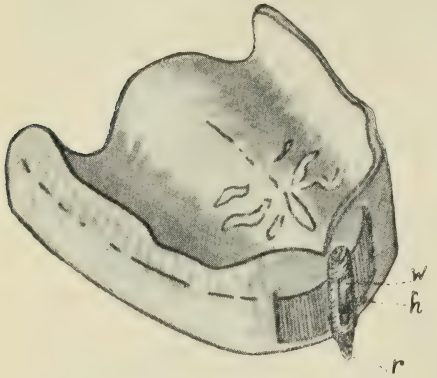
From the angle K M K the relative position of the balancing or rotation points of the mandible can be determined. (See Fig. 16.)

If both sides of this angle are extended beyond the intersecting point (see dotted lines in Fig. 16), the direction of the path of the lower incisors and canines during mastication is shown.

This angle of the incisor path varies in different individuals, and therefore the center of rotation varies correspondingly. In my investigations I have found that the relative distances between these rotation points may vary from 7 to 13 cm. measured by a line drawn through the center of the condyles.

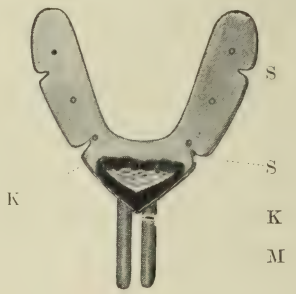
In some cases these rotation points may lie still farther away from the condyles. As the average distance (according to Bonwill) between the condyle centers is 10 cm. the rotation points may lie some-

FIG. 13.



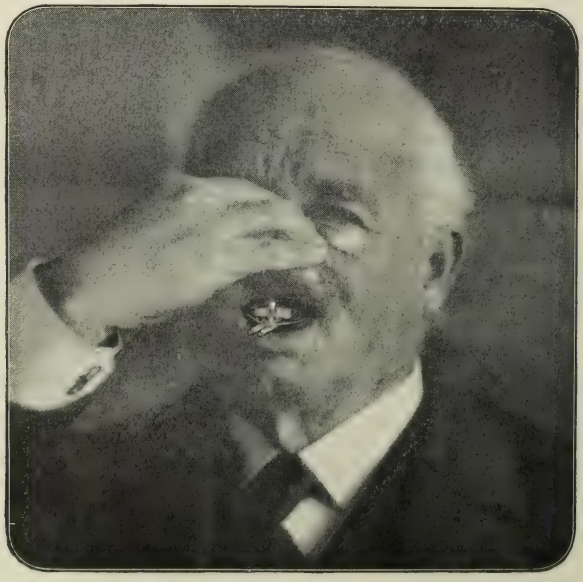
The small register fastened to the upper wax model.

FIG. 14.



Horse-shoe plate with registered incisor path.

FIG. 15.



Registering the incisor path.

times inside and sometimes outside of the condyles. Very often the rotation point in the same individual may be differently situated on each side: *e.g.* the one may lie inside, the other outside the condyle.

The importance of determining the exact position of these rotation points can be best understood by making a drawing like that in Fig. 16 on a triangular piece of cardboard, and recording the movements of the incisor point of the triangle by sticking a pin successively through the balancing points of 7, 10, and 13 cm. and with a sharp lead-pencil point inserted through the incisor point recording the lateral movements. The result will show three different paths.

Fig. 17 shows how both condyles carry out the same movement (in lateral movements) when the rotation points lie outside of the condyles 12 cm. apart, while the lead-pencil points attached to the large register will mark paths in the opposite direction.

Fig. 18 shows how both the condyles and the lead-pencil points of the large register will record opposite paths in lateral movements when the rotation points lie inside the condyles.

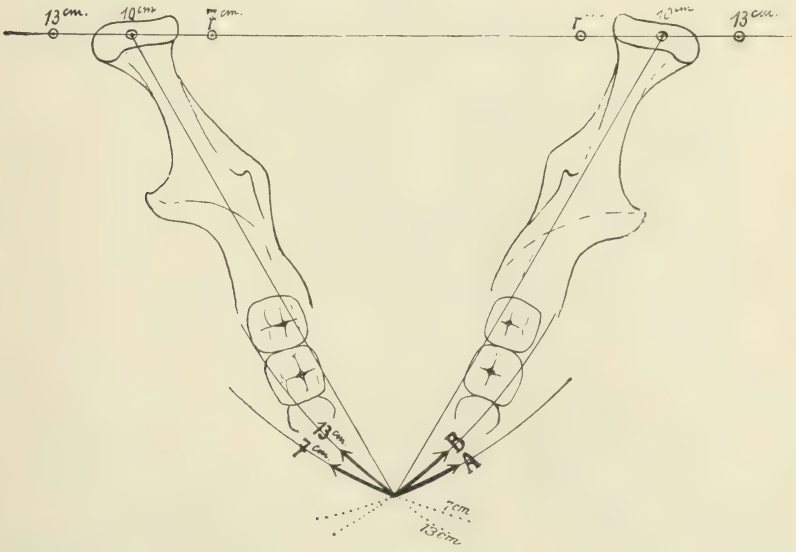
It is clear from these two illustrations that it is possible to determine the position of the rotation points from the relations of the paths (of the forward movement on the right sides and the backward movements on the left sides of Figs. 17 and 18) recorded by the registering instrument; but this method would not be accurate enough, owing to the short length of the paths, and therefore from even small mistakes in measuring great differences would arise.

From the position of these rotation points it is plain that they could not be considered as anatomically fixed points, but rather as ideal balancing-points, and for that reason their existence has remained unrecognized so long. Walker recognized their existence in 1896. (See DENTAL COSMOS, January 1896, p. 34, and July 1896, p. 573.)

A balancing point is therefore the axis of rotation resulting from the diverse contractions of the masticatory muscles, and happens to coincide only now and then with the condyles. As it is impossible to imitate the muscles of mastication on an articulator, these balancing-points must be substituted by mechanical centers of rotation the positions of which can be changed from case to case.

The natural condyles cannot be considered as true rotation points or axes around

FIG. 16



which the various movements of the mandible occur, but should only be regarded as fixed guides of the mandible in its movements.

It is therefore not necessary to try to imitate the natural condyles nor the glenoid fossa on an articulator, but it is necessary to imitate the muscle movements by constructing mechanical centers of rotation (as already stated) and mechanical condyle path guides, as represented in my articulator by slotted plates.

Fig. 17.

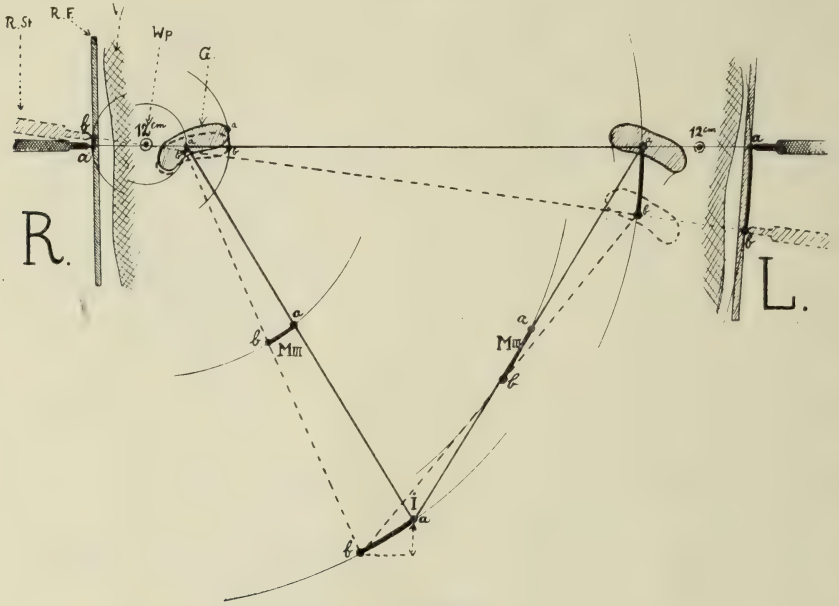
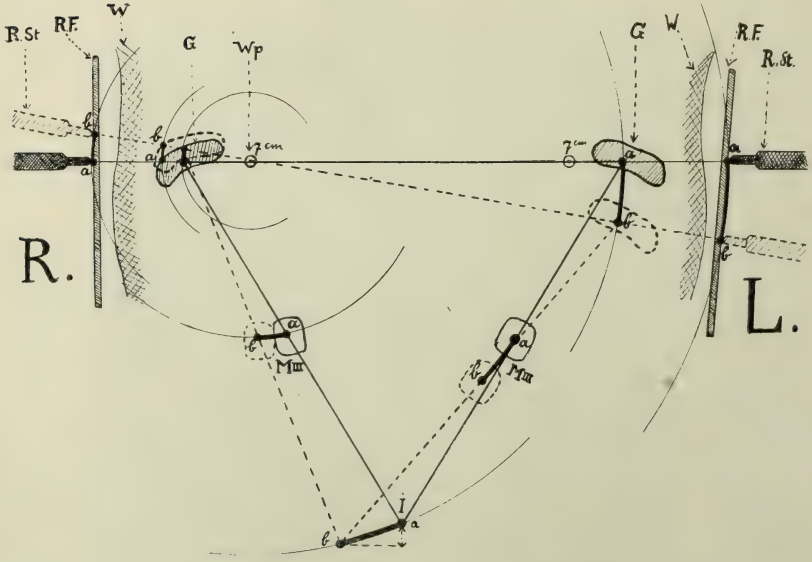


Fig. 18.



Figs. 17, 18: *R St*, Registering point. *R F*, Registering surface. *W*, Soft parts over the joint. *Wp*, Balancing point. *G*, Condyle. *a*, *b*, Moving path of the chief points of the mandible and of the registering points in lateral movements.

The importance of knowing the relative position of the balancing-points is made clear in Figs. 19 and 20.

FIG. 19.

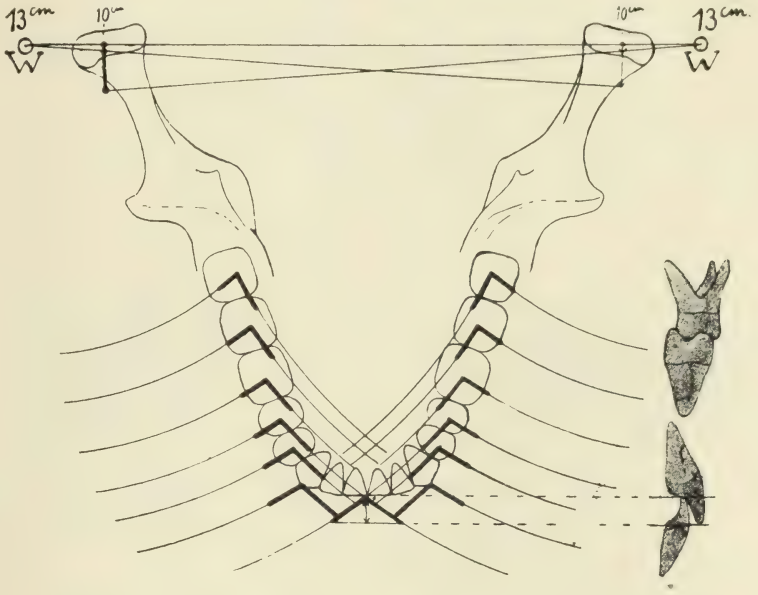
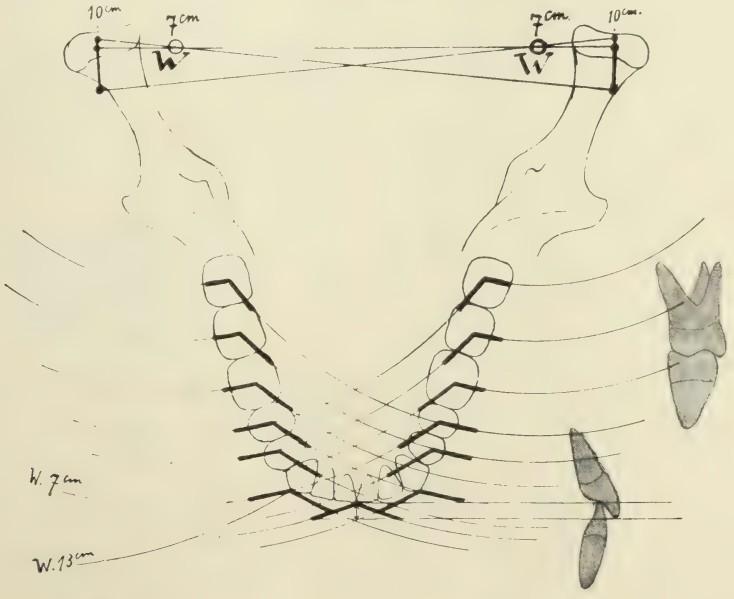


FIG. 20.



These balancing-points can be constructed either geometrically with compass and rule, or simply by drawing on a piece of cardboard an equilateral triangle with sides of about 13 cm. in length, on which the outline of the mandible is drawn, with the teeth as in Figs. 19 and 20. Attach with wax small graphite points between the central incisors, also over the canines and over the middle of each molar. Grind these points

to an equal height with a piece of sandpaper. Set the cardboard with the points downward on a piece of writing paper, insert a pin through the middle of each condyle, and make lateral masticating motions with the cardboard, when the graphite points will record their individual movements. If the same experiment is made with the pin inserted through the extreme balancing points of 7 and 13 cm. distance, quite different results will be obtained. These two-dimensional tracings as shown in Figs. 19 and 20 are not quite accurate; the angles would be slightly different in a normal natural case, where there is an overbite of incisors, and therefore a three-dimensional movement.

In cases where the balancing points lie outside of the condyles, the mandible in lateral movements moves at the same time strongly forward. As the lower incisors are, however, somewhat hindered by the overbite of the upper incisors, the mandible glides downward and outward on the lingual surfaces of the upper incisors; consequently a longer overbite of the canines and higher cusps of the molars are necessary, in order that the teeth may not move too quickly away from each other. (See Fig. 51.)

When, however, the positions of the balancing points lie inside of the condyles, the lower incisors move forward less obliquely and almost directly sideward, whereby for some distance the contact with the upper incisors is secured; consequently the overbite may be less and the cusps of the molars may be lower.

The positions of the balancing points are still more important in regard to the relative positions of the upper and lower canines. To present this fact more clearly, the path of the canine in Fig. 19 is presented on the left side of Fig. 20, showing the difference in the paths of the lower canines according to whether the balancing point of 7 cm. or of 13 cm. asserts itself.

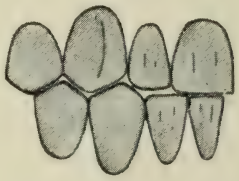
Fig. 21, for example, shows a side view of the canines in the normal occlusion as they are usually set up in an articulator for a practical case. Fig. 22 shows the same in a lateral movement. If, however, the patient has a different balancing point, the canines will describe another path, and the upper canine will not pass properly through the space between the lower bicuspid and canine, but will rather strike against the cusp of the latter, thus forming the only contact point of the tooth rows, and thereby tilting and loosening the upper plate. (See Fig. 23.) With such an artificial den-

Fig. 21.



Normal occlusion of artificial teeth.

Fig. 22.



Normal position in a lateral movement when the correct balancing point has been secured.

Fig. 23.



Incorrect position in a lateral movement when the balancing point of the articulator differs from the natural one.

ture lateral movements are absolutely impossible, and the patient in eating is compelled to carry on only up-and-down movements, or else ultimately the cusps of the canines as well as those of the bicuspids must be ground off, whereby the natural appearance and the usefulness of the denture is destroyed.

As I have already stated, the mandible cannot make a free lateral movement, being partly prevented by the overbite of the upper incisors. Therefore the lateral movements are combined with the opening and closing movements. If no overbite were present, the front teeth in the lateral bite would, after a short grinding movement, glide away from each other, and the whole force of the masticatory muscles would rest on the molars exclusively, so that the latter would be worn away altogether too quickly. These conditions may be noted in the ruminants (horses, cows, etc.); the increased wearing away of the molars is, however, compensated by their numerous and deep enamel folds.

The upper incisors, because of their slanting surfaces on the lingual side, have the important function of acting as the anterior guiding and gliding plane of the mandible, while the condyles and the eminentia articularis act as guides of the posterior movements of the mandible. These latter guiding planes of the two posterior points of the triangle have a slant of from 5° to 50°, while the anterior point of the triangle or incisor guide exhibits a slant of from 50° to 70° to the occlusal plane. (These angles are measured with the instrument shown in Fig. 49.)

In edentulous patients it has been impossible so far to determine the previous guide angle of the incisor. I believe, however, that this represents a racial phenomenon, directly dependent upon the facial angle. From a small number of measurements I have found that the angle of the slant of the lingual surfaces of the incisors, which form the incisor guide, amounts to 15° less than the facial angle formed by a line connecting the outer ear with the base of the nose, and a line connecting the most prominent part of the forehead with the base of the nose. These measurements are, however, too small in number and too superficial to serve as full proofs.

If the angle of the guiding surfaces of the incisors is determined in such an arbitrary way, it is of no practical value in an artificial denture. For practical reasons, which will be discussed in a subsequent chapter, I nearly always choose the lowest angle, of about 45° or less, for this gliding angle of the incisors.

From all these considerations it follows unquestionably that in lateral movements the centers of rotation or balancing points lie approximately on a line passing through the center of the condyle region, and that these balancing points in different individuals may lie either on the inside or the outside of the condyles.

As I shall show later, the mandible in opening and closing rotates around another center, which, however, has no influence in the setting up of the teeth for articulation, and therefore need not be considered in the construction of an articulator. In the Walker articulator this opening axis can be attached, and is used when the plane of articulation is to be lowered or raised. In the Kerr articulator the true axis of rotation on opening is permanently fixed on the articulator. In my articulator the ordinary axis for opening and closing movements is used—as it has no influence on the slant of the condyle path—in the same way as in Walker's and Christensen's articulator.

From these observations it follows that in the construction of an articulator the following points should be considered:

(1) An individually changeable slant of the condyle path.

(2) An individually changeable form of the condyle path.

(3) A changeable incisor guide.

(4) Two individually changeable balancing or rotation points.

(5) The incisor guide must not change the slant of the condyle path; the slant of the condyle path must, therefore, be independent of the opening movement.

(To be continued.)

SOME NEW RESEARCHES INTO AMALGAMS, AND THEIR SIGNIFICANCE IN DENTAL PRACTICE.

By A. FENCHEL, Sc.D., L.D.S., Hamburg.

IV. THE CONSTITUTION OF THE PURE TIN-SILVER ALLOYS.

Tin-Silver.

THE relationship of these two components to each other has been investigated by various researchers and by various methods. Their respective works are noted in our bibliography under Nos. 1, 2, 5, 10, 15, 16, 17, 18, 19 to 22, 32, 34, 35a, 37, 38b, 42, 47, 49, 50, 56, 82. In these the following chemical compounds have been stated: (1) Ag_4Sn, (2) $AgSn_3$, (3) Ag_2Sn_3, (4) AgSn, (5) Ag_2Sn, (6) Ag_3Sn, (7) Ag_4Sn, (8) Ag_6Sn. Burchard ([87]) assumes Ag_2Sn. Aside from this being surprising in itself, closer examination reveals that the earlier investigators confined themselves to individual methods of investigation. We know today that each of the individual physical methods has inherent shortcomings. The chemical analysis of the residua of the mother-lye, however, is, owing to the high fusing-points of the metals, a more than delicate task.

Great praise is due to Tamman ([77], [77a]) for the perfection of the investigation of metals. He has showed how by a methodic construction of the diagrams of solidification in combination with the microscopic observation of grindings of the reguli and determination of differences in potential, in an overwhelming majority of cases inferences may be drawn as to the chemical affinities of binary and ternary metal alloys.

The present investigation is chiefly based upon the work of Petrenko ([82]), the contents of which closely coincide with the works of Charpy ([10]), Gautier ([15], [16]), and Heycock and Neville ([19]-[22]). Of the eight AgSn combinations only a single one is now left, *i.e.* Ag_3Sn. Tamman himself ([77a]), to be sure, assumes a combination Ag_4Sn, without, however, stating why he digresses from Petrenko.* Petrenko's diagram of crystallization teaches us, besides the fusing-points of the individual concentrations, several very important facts in relation to our knowledge of the amalgams. We get to know the different conditions of the AgSn alloys according to their respective treatment in fusing. (Diagram No. I.)

The 73 per cent. AgSn combination shows the property of forming mixed crystals with the pure silver crystals. This means that in the ex-crystallization into the crystal structure of a single Ag_3Sn crystal, crystallites of pure silver may insert themselves; that consequently the combination in all its crystallinic properties is completely identical with pure silver—they are isomorphous. Microscopically, therefore, the alloys cannot be distinguished from 75 to 100 per cent. silver. The mixed crystals up to 25 per cent. tin are, on the other hand, not entirely alike. According to the rapidity of cooling, the 25 per cent. mixed crystal may cleave, at the temperatures of from 480° to 220° C., into the combination Ag_3Sn and a new mixed crystal of 19 per cent. tin. Nor is the combination Ag_3Sn stable, but cleaves when slowly cooled in various temperatures into that combination and one of the two mixed crystals, or into that combination and the eutecticon of the combination with pure

* [I have since received a communication from Professor Tamman, stating this to have been a mistake on his part.—A. F.]

tin; this consists of 96.5 per cent. silver plus 3.5 per cent. tin.

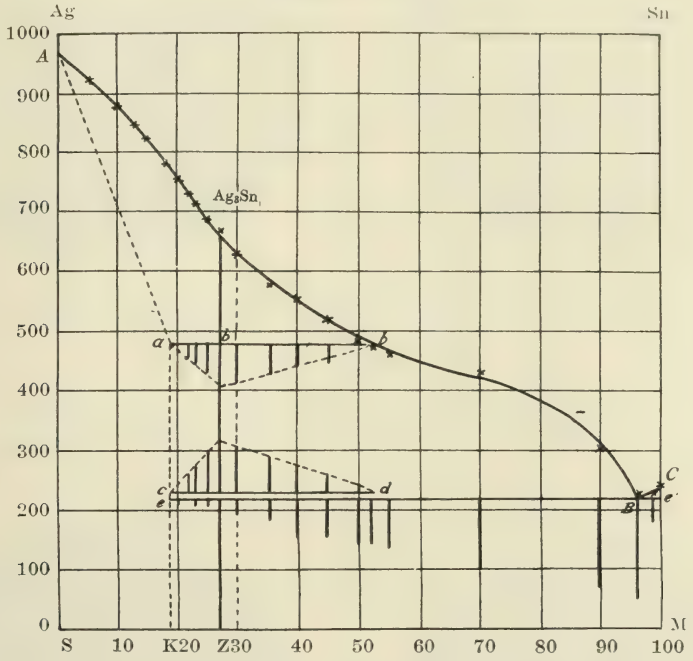
These differences in behavior may be traced up to the concentration 48 silver 52 tin. This combination shows a pure mixture of the combination Ag_3Sn and the above-mentioned eutecticon, regardless of the method of fusing or the cooling process. From this we conclude that

(1) In the presence of tin from 0 to 5 per cent., large mixed crystals in slow cooling, small ones in chilling.

(2) In the presence of tin from 5 to 17 per cent., mixed crystals with the 72 per cent. combination are formed only when the molten mass is slowly cooled to the first ex-crystallization and is then suddenly chilled. (Figs. 1 and 2.)

(3) From 27 to 53 per cent. of tin

Diagram No. I.



Solidification of the tin-silver amalgams according to Petrenko.

in considering the constitution of the pure tin-silver alloys the composition by percentage is not the only determining factor, but also the method of the fusing, the duration of the cooling, its acceleration at the critical points, viz, the retardation at the temperatures of ex-crystallization. This difference in behavior also explains the discrepant results stated in the above-named literature. We are familiar with the same processes from the well-known phenomena in iron-carbon alloys, etc.

The above deductions are indorsed by Figs. 1 to 4, taken from Petrenko. In the different combinations various images are observed, as follows:

produces in ordinary cooling long combination crystals which are enveloped by a second element. In very slow cooling we obtain the combination Ag_3Sn as the primary precipitate in the surrounding eutecticon. (Figs. 3 and 4.)

(4) From 52 to 96 per cent. of tin always gives combination plus eutecticon, regardless of the mode of cooling.

THE VOLUMETRIC BEHAVIOR OF THE TIN-SILVER ALLOYS.

Concerning this subject I have published a contribution in the January 1909 issue of Dental Cosmos, which requires a correction. Fortunately enough, I had myself stated that I had

made a mistake in the introduction of the formula of calculation in my previous

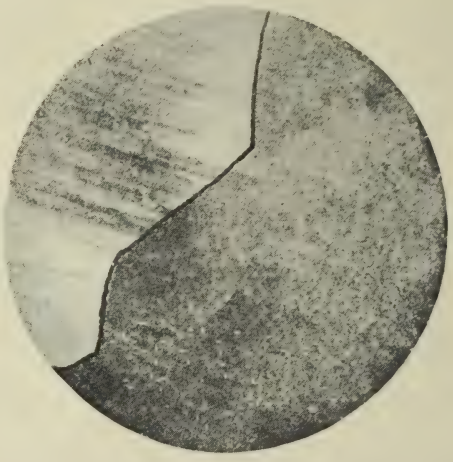
In studying the literature on this subject, moreover, I noted that Maey [32]

Fig. 1.



Tin 15, silver 85, according to Petrenko, naturally cooled. Enlarged 24 times. Etched with NH_3 and H_2O_2.

Fig. 2.

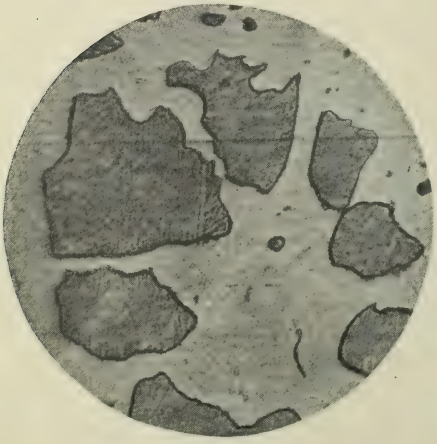


Tin 15, silver 85, cooled very slowly to 400° C. and chilled. Enlarged 68 times. Etched with diluted HNO_3.

essay. The diagram drawn at that time must therefore be replaced by another

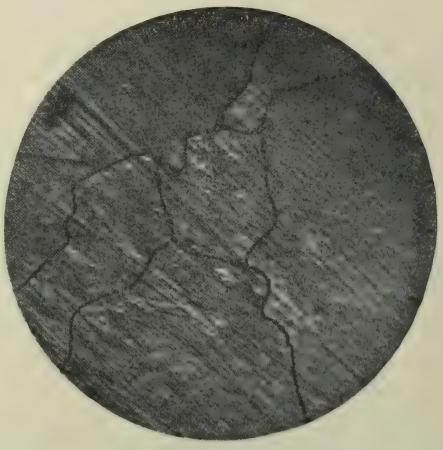
had already written on this subject, obtaining almost the same results as myself.

Fig. 3.



Tin 26.9, silver 72.1, naturally cooled. Enlarged 200 times. Etched with NH_3 and H_2O_2.

Fig. 4.



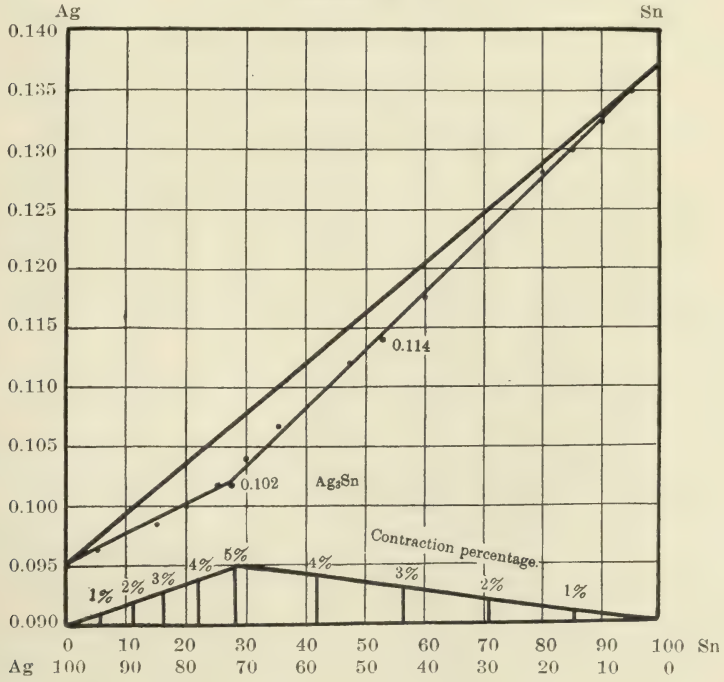
Tin 26.9, silver 72.1, after slowly cooling chilled at 480° C. Enlarged 68 times.

(see Diagram No. II). I would also retract here the allegation of miscalculation preferred against Black, as not he but myself am guilty of error.

Since my figures, however, give exactly the combination Ag_3Sn, while Maey's maximum lies at about 70 per cent., I have used my own diagram. Maey him-

self, indeed, assumes the combination as a probable result. Consequently in the formation of the chemical combination Ag_3Sn we have to deal with a contraction of 5 per cent. of the volume. At the foot of the diagram from the schematic combination of the maximal points of deviation the resulting contraction of a tin-silver alloy can be exactly and simply read off for each percentage. (Diagram No. II.)

Diagram No. II.



Specific volume of the tin-silver alloys.

Silver-Mercury.

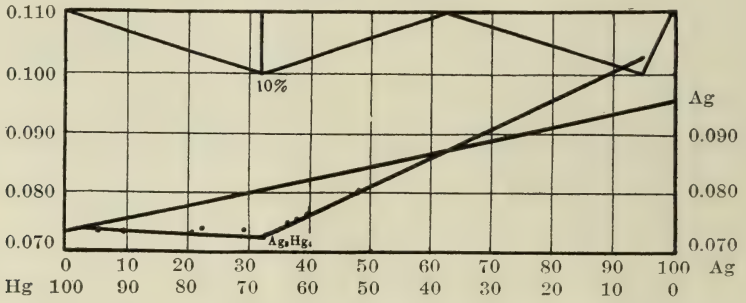
It would lead too far to review the entire literature on this subject. Suffice it to state that former authors have claimed as chemical combinations—(1) $AgHg_4$, (2) $AgHg_3$, (3) $AgHg_2$, (4) Ag_5Hg_{16}, (5) Ag_8Hg, (6) $Ag_{11}Hg$, (7) $Ag_{13}Hg$. Burchard (*loc. cit.*) assumes Ag_2Hg. In the bibliography the respective authors are found under Nos. 3, 4, 6, 7, 8, 11, 12, 13, 17, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33, 37, 39, 40, 43, 44, 45, 46, 48, 50, 51, 52, 53, 54, 83. I shall here confine myself to the most recent literature. I would also mention that the manufacture of silver amalgam is very difficult owing to the great difference between the fusing-point of the silver and the temperature of evaporation of the mercury, which amounts to 650° C. Owing to this difficulty in treatment, various methods for the production of silver amalgams have been followed in investigating them.

Maey ([32], [33]) dissolves the silver in heated Hg, then pours off the mother-lye, and determines the percentage of Hg in the crystals obtained by evaporation. Up to 10 per cent. silver the mass was pulpy, later solid. Further reduction of Hg was obtained by pressing in an iron press with a wooden piston. By heating the press Maey reached 39 per cent. of silver. Amalgams poor in mercury were obtained by evaporation, then condensed by hammering and pressing.

Ogg ([43]) introduced mercury into

an aqueous solution of silver nitrate ($AgNO_3$). Hg precipitates Ag, and on shaking forms with it an amalgam. Ogg reports that Hg in aqueous solution is bivalent, consequently combines after the formula $2Hg + 2Ag^{\cdot} = Hg^{\cdot\cdot} + Ag^{\cdot} + 2Ag$. At room temperature but little silver was dissolved in Hg; it was therefore heated to 82° C. The resulting combinations were determined, first, by pressing out the mercury through leather; second, by Ag_3Hg_4 and Ag_3Hg_2; Reinders also claims Ag_3Hg as being probable. Consequently we surely have to deal with the combination Ag_3Hg_4 and Ag_3Hg_2. Ag_3Hg_4 corresponds with a combination of 71.2 Hg + 28.8 per cent. Ag. Ag_3Hg_2, on the other hand, is equal to 44.7 per cent. Ag + 55.3 per cent. Hg. We may therefore expect that—First, an amalgam is formed having the formula Ag_3Hg_2. If, after that, free mercury

Diagram No. III.



Specific volume of the silver-mercury amalgams according to Maey.

determining the equilibrium in the vacuum, yielding as the result Ag_3Hg_4.

Ogg (*loc. cit.*), further, established the difference in vapor tension between silver amalgam and pure Hg. He found that 71 Hg combined with 29 Ag, or the solid amalgam in equilibrium with excessive mercury had the formula Ag_3Hg_4. From this he then concluded that amalgam is nobler than either of its constituents, Ag and Hg. The nobler, however, a metal, the less readily it combines [with O or S in the mouth.—Author] and the more readily it leaves its combinations. Furthermore, the nobler a metal the smaller the intensity of current required for its electrolytic separation. From a mixed solution of Ag and Hg salts the amalgam, according to Ogg, separates under smaller intensity than its components, hence it is nobler.

Reinders ([83]), by measuring the differences in potential between the pure elements and the resulting amalgams, which he also obtained from mixtures of $AgNO_3$ and $HgNO_3$, ascertained the chemical affinity, with the result of is still present, a part of the Ag_3Hg_2 is dissolved and Ag_3Hg_4 is newly formed.

Volumetric behavior.

Owing to the coincidence of Maey's results with those of Reinders and Ogg, we can assume that he is correct. Diagram No. III presents Ag + Hg according to Maey (*loc. cit.*). According to this diagram, in the combination Ag_3Hg_2 we have to deal with a contraction of 5 per cent., while Ag_3Hg_4 shows a contraction of 10 per cent. I would add that in spite of zealous efforts I have not been able to obtain by trituration in the mortar and fusing, perfect homogeneous reguli of silver amalgam. It was always noted that the silver was amalgamated merely on the outside, and that the resulting amalgam contained a large proportion of free silver. Threatened by danger of poisoning, I was finally forced to desist from further experiments. Other dental metallurgists claim to have easily obtained silver amalgam by simple trituration in the mortar. On the basis of my experi-

ments I must doubt the homogeneousness of their final results.

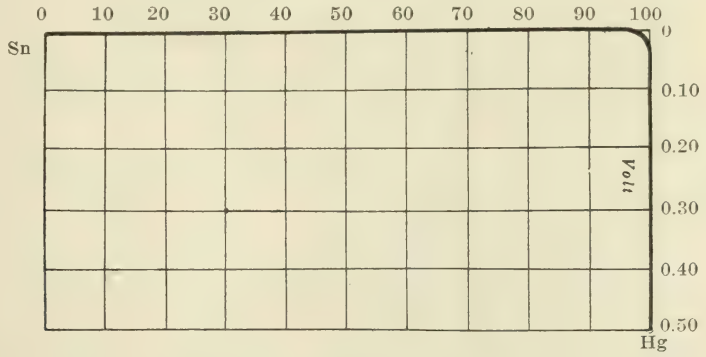
Tin-Mercury.

Less recent authors have determined the following combinations: (1) $SnHg_5$, (2) Sn_3Hg_5, (3) SnHg, (4) Sn_2Hg, (5) Sn_8Hg. Burchard, like No. 3, assumes SnHg. These authors are given in the bibliography under Nos. 3, 4, 8, 12, 17, 23, 24, 26, 27, 28, 29, 34, 35, 37, 39, 40, 41, 46, 47, 51, 52, 54, 55, 57-64, 66, 67-75, and 78. Of recent works the following are most noteworthy: Puschin ([84]) and Heteren ([85]).

Puschin from the course of the curves of solidification concluded that tin and mercury do not enter into chemical combination, but form solid solutions. His determination of the differences in potential between the alloys and the individual components confirms the result. When the difference in potential was zero, Puschin concluded that the components present were pure. The point of deficiency in potential indicates the formation of a combination. With HgSn the diagram shows a simple straight line without disturbance, hence the above result. (Diagram No. IV.)

Puschin also examined the microstructure of various amalgams, but could obtain images only with cadmium. Nevertheless he concludes also for tin-amalgam constantly hexagonal structure. If a Sn amalgam crystallizes differently, this must needs also be expressed in the curve of solidification, and must give a curve of the hexagonal and one of the regular system. Puschin surmises that Hg in alloys with Sn goes into the hexagonal system and in crystallizing yields isomorphous mixtures. In the periodic system Hg stands with Ba, Mg, Zn, Cd, all of which belong to the hexagonal system. It is therefore nothing extraordinary when Hg crystallizes like these. From the similarity of the amalgams of Zn, Pb, Cd, and Sn, Puschin again draws conclusions as to the absence of chemical combinations.

Diagram No. IV.

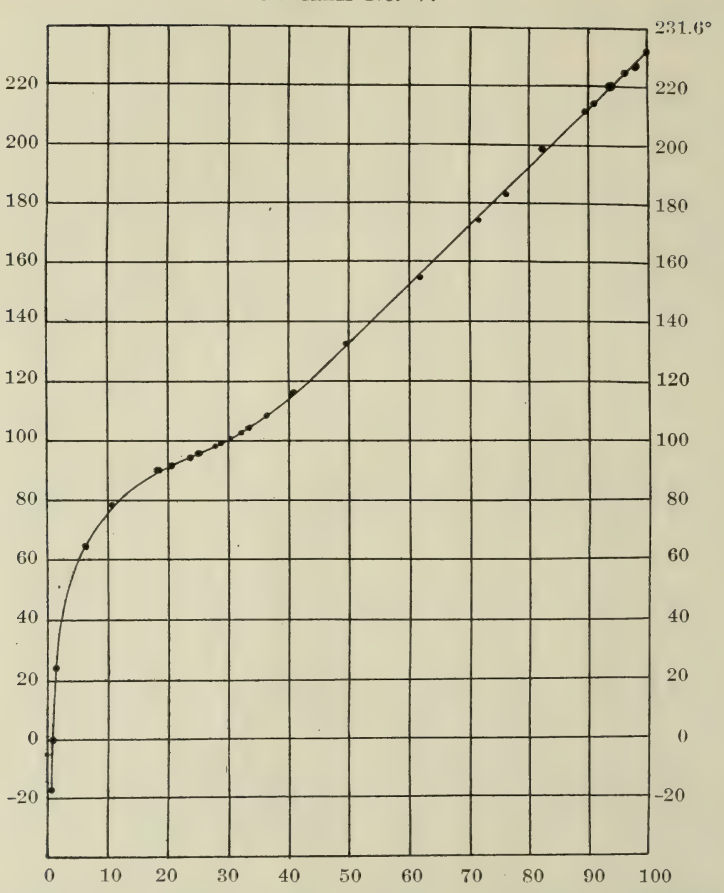


Determinations of potential of the tin-mercury amalgams according to Puschin.

Heteren (*loc. cit.*), who designed a complete diagram of solidification of tin amalgam, arrives at similar conclusions as to the higher percentages of tin and the temperatures of solidification which concern us here. We may neglect his results for the high Hg percentages, as we are here only concerned with temperatures above 16° C. (Diagram No. V.)

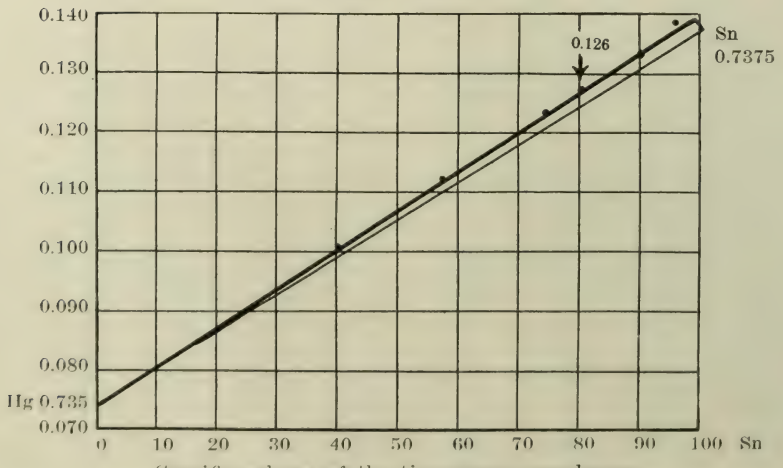
Heteren assumes for temperatures below 20° C. a change of the tin into the gray modification even in amalgams. This change in temperatures below 20° C., which has been demonstrated by Cohen ([88]) with church organ pipes, has great importance for us in regard to the preservation of our stock of amalgam in winter. Upon being heated above 20° C.

Diagram No. V.



Solidification of the tin-mercury amalgams according to Puschin.

Diagram No. VI.



Specific volume of the tin-mercury amalgams.

the tin returns to the white modification. The specific volume and also the coefficients of expansion, crystallization, and contraction of gray tin are different from those of white tin.

From his experiments on the various differences in potential and from his diagram of solidification, Heteren (*loc. cit.*, page 167) draws a number of conclusions, of which the following are of interest to us:

(1) In a liquid state tin and mercury mix perfectly.

(2) At 25° C. the solid phase consists of 94 atomic per cent. of tin determined analytically, or 99 per cent. of tin determined electrically.

(3) Pure tin at 20° C. shows a change into the gray modification.

Heteren's statements on the dilatometric gradation per degree C. are interesting and noteworthy:

Gradation per degree C.

Temperature.	Sn 75.61 per cent.	Sn 49.76 per cent.
14	0.66	0.10
17.1	0.54	0.09
19	0.50	0.11
20.5	0.60	0.09
21.65		0.09
23.6		0.11
26	0.68	0.11
27.5	0.52	0.11

Temperature.	Sn 81.88 per cent.	Sn 100 per cent.
11.2	0.84	0.72
16.2	0.86	0.73
20.2	0.86	0.73
25	0.88	0.73
		0.74
		0.75 at 35.5°

gradation per degree C.

These figures give us a hint that in introducing amalgam into the mouth, owing to the difference in temperature—about 18° C.—we have to reckon with an expansion, even though it be small.

In gaging my dilatometers I marked the expansion of about 1.5 ccm. of amalgam ready for use, per degree C. in the vacuum as 0.5 cmm.; between from 16° to 40° C., *i.e.* 0.00033 of the volume. The respective data in the tables of Landolt and Börnstein ([88]) and Ladenburg ([89]) are noteworthy in this connection. My own determinations of the diagram of crystallization indorse the results of these authors. My microscopic investigations, however, showed deviations. I succeeded in obtaining good images of the concentrations from 50 to 95 per cent. Sn. Grindings were made on 100-minute paper, polished on soft silk velvet, etched with hydrochloric acid 10 per cent. for twenty-four hours.

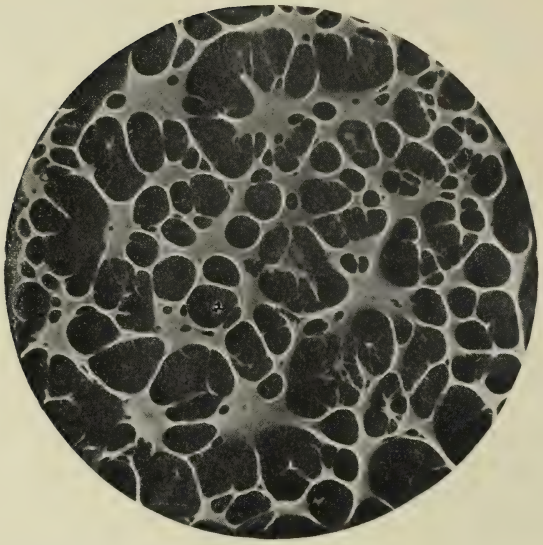
My images gave a saturated homogeneous mixed crystal at 80 per cent. tin, while Heteren assumes such a crystal only at 96 atomic per cent. The alloys richer in mercury show the mixed crystal surrounded with the 3 per cent. eutecticon, which solidifies at —42° C. according to Heteren (*loc. cit.*). Down to 50 per cent. I succeeded in obtaining images in which we see the crystals decreasing continuously, while the eutecticon increases. Above 80 per cent. tin gave entirely changed images. (Figs. 5-9). A primarily precipitated dark element is surrounded by a light one. With increasing concentration the dark element increases in quantity, while the light one decreases. In the dark element we evidently have to deal with primarily precipitated pure tin—*i.e.* with a possible second mixed crystal; while the light element consists of the saturated 80 per cent. mixed crystal. In the images of 80 per cent. and above it appears light, as these preparations are etched, while the images below 80 per cent. have been obtained by relief polish.

This observation coincides with the former statement of Hersford ([24]), who by removing the mercury with a tin staff determined the $AgSn_8$ crystals claimed by him to be a chemical combination. This combination would contain 82.5 per cent. tin. It is by no means impossible that a microscopic examination also would show this combination. For our purpose the 2½ per cent. makes no practical difference.

Volumetric behavior.

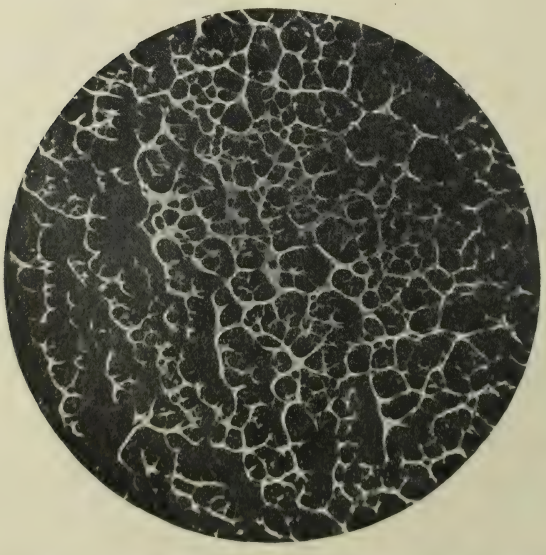
The changes in volume as far as they depend upon temperature have been

Fig. 5.



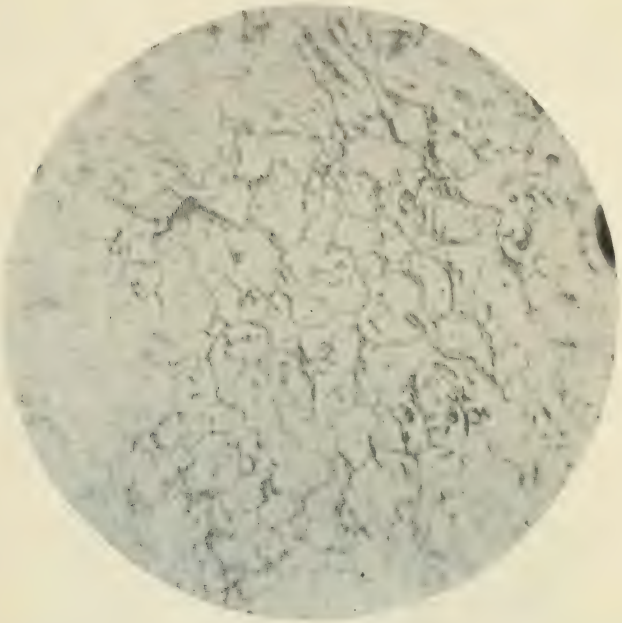
Tin 50, mercury 50, ground and polished in relief. Enlarged 160 times. The picture shows the large black tin-silver mixed crystals in the light fluid eutecticon, which solidifies at about —42° C. Proportion of mixed crystals to the eutecticon, 62.5 : 37.5.

Fig. 6.



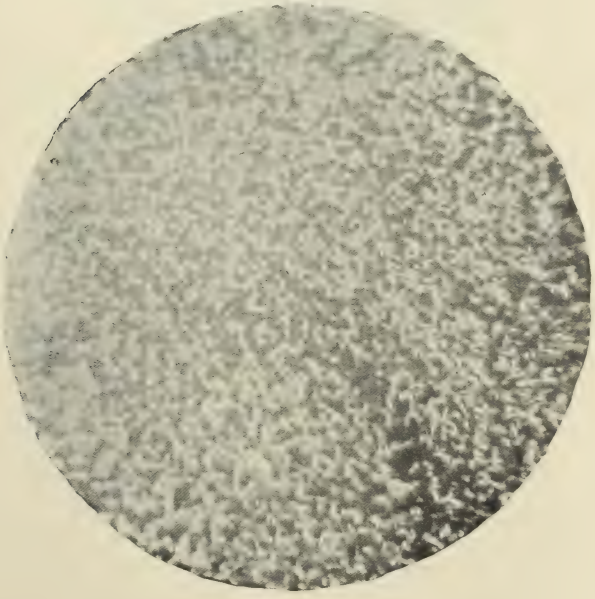
Tin 70, mercury 30, treated like Fig. 5; same picture with increased contents of mixed crystals. Enlarged 160 times. Proportion of mixed crystals to the eutecticon, 87.5 : 12.5.

Fig. 7.



Tin 80, mercury 20. Enlarged 160 times. Almost pure homogeneous mixed crystals whose polygons are plainly distinguishable. Polished on silk velvet. Etched with 10 per cent. hydrochloric acid for twenty-four hours. The mixed crystals now appear gray.

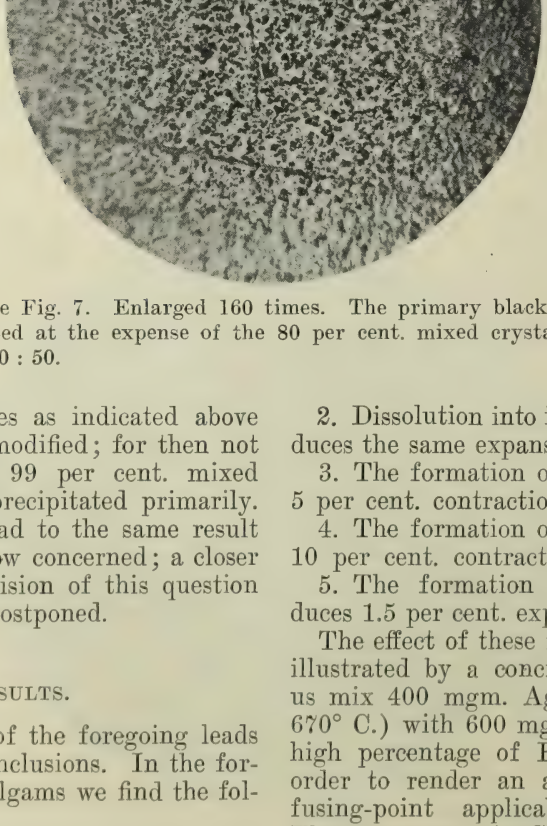
Fig. 8.



Tin 85, mercury 15. Enlarged 160 times. Treated like Fig. 7. Shows a primarily precipitated black element—pure tin or a secondary saturated mixed crystal—and the 80 per cent. saturated mixed crystal. Proportion, 75 : 25.

already mentioned. My diagram of the specific volume of the HgSn amalgams shows a maximum of expansion at 99 per cent. tin. (Diagram No. VI.) This figure coincides with the result of analysis and of differences in potential which led Heteren to make final conclusions as to a mixed crystal of 98 or 99 per cent. tin respectively. If this result, which coincides with my diagram, is correct, then the explanation of my pictures as indicated above would have to be modified; for then not free tin, but the 99 per cent. mixed crystal would be precipitated primarily. Practically both lead to the same result as far as we are now concerned; a closer discussion and decision of this question will therefore be postponed.

Fig. 9.



Treated like Fig. 7. Enlarged 160 times. The primary black precipitate increased at the expense of the 80 per cent. mixed crystal. Proportion, 50 : 50.

Results.

An application of the foregoing leads to the following conclusions. In the formation of our amalgams we find the following phases:

(1) Formation of the chemical combination Ag_3Sn.

(2) Dissolution of Ag_3Sn on the addition of Hg.

(3) Formation of the combination Ag_3Hg_2.

(4) Formation of the combination Ag_3Hg_4.

(5) Formation of the saturated mixed crystal $Sn_{80}Hg_{20}$.

1. The combination Ag_3Sn takes place under contraction of 5 per cent. of its volume.

2. Dissolution into its constituents produces the same expansion.

3. The formation of Ag_3Hg_2 produces 5 per cent. contraction.

4. The formation of Ag_3Hg_4 produces 10 per cent. contraction.

5. The formation of $Sn_{80}Hg_{20}$ produces 1.5 per cent. expansion.

The effect of these figures may now be illustrated by a concrete example: Let us mix 400 mgm. Ag_3Sn (fusing-point 670° C.) with 600 mgm. mercury. This high percentage of Hg is necessary in order to render an alloy of such high fusing-point applicable in dentistry. The 400 mgm. Ag_3Sn (specific volume —0.102) are equal to 40.8 cmm. These are dissolved into their constituents by

the mercury under an expansion of 5 per cent. of their volume = 10.8 cmm. Expansion, +2 cmm.

Now the 400 mgm. Ag_3Sn are dissolved in 73 per cent. = 292 mgm. Ag and 27 per cent. = 108 mgm. Sn; 292 mgm. Ag form with the Hg, first, Ag_3Hg_2. The approximately 300 mgm. Ag combine with 55 per cent. = 375 mgm. Hg. Further, the 108 mgm. Sn present combine with 20 per cent. = 27 mgm. Hg to form the saturated mixed crystal $Sn_{80}Hg_{20}$. Consequently about 400 mgm. Hg are taken up and 200 mgm. remain. These, again, dissolve part of the Ag_3Hg_2 crystals and convert them into Ag_3Hg_4, with a percentage of 71.2 Hg. In 100 mgm. Ag_3Hg_2 about 44.8 mgm. Ag are found. In order to form Ag_3Hg_4, 112 mgm. Hg are required, while 55.3 mgm. Hg are present. Every surplus 57 mgm. Hg, consequently, convert 100 mgm. Ag_3Hg_2 into 157 mgm. Ag_3Hg_4. Consequently, of the 675 mgm. Ag_3Hg_2 formed, 350 mgm. can be converted into the combination Ag_3Hg_4 by the surplus 200 mgm. Hg. yielding 550 mgm. Ag_3Hg_4. The final result after all chemical reactions have taken place consequently gives in a mixture of 400 mgm. Ag_3Sn and 600 mgm. Hg—

(1) 138 mgm. $Sn_{80}Hg_{20}$.

(2) 325 mgm. Ag_3Hg_2.

(3) 550 mgm. Ag_3Hg_4 (13 mgm. + difference owing to the approximate calculation).

Before the chemical combination we had established an expansion of +2 cmm. in the dissolved combination Ag_3Sn. Note in addition:

1. 138 mgm. $Sn_{80}Hg_{20}$ (ideal specific volume —0.124) equal 18 cmm. 1.5 per cent. expansion gives +0.27 cmm.

2. 325 mgm. Ag_3Hg_2 (ideal specific volume —0.083) = 27 cmm.: 5 per cent. of contraction giving —1.14 cmm. (contraction).

3. 550 mgm. Ag_3Hg_4 (ideal specific volume —0.08) = 44 cmm.: 10 per cent. contraction giving —4.4 cmm. (contraction).

This for a filling of 1 gram in weight gives an expansion of 2.27 cmm. *versus* a contraction of 5.54 cmm., consequently a resultant contraction of 3.27 cmm. in an entire volume of 129 cmm., or about 2.6 per cent.

From these figures it is further seen that the contraction could be considerably reduced, or done away with entirely, by using smaller quantities of mercury. Yet it must be emphasized that the high fusing-point of 670° C. of the alloy Ag_3Sn at room temperature does not permit the reaction to be completed.

In mixing such amalgams, only part of the constituents is amalgamated, and the free remnants of the metals oscillate until the completion of the reaction, causing a change in form and color, as I have before shown in an illustrated article ([90]).

Let us, on the other hand, observe the course of the reactions in the formula silver 48, tin 52. For its dental manipulation this requires only a proportion of 400 Hg to 600 filings.

Calculation: 600 mgm. of the alloy $Ag_{48}Sn_{52}$ contain 396 mgm. Ag_3Sn and 204 mgm. Sn (really the eutecticon Ag 96.5, Sn 3.5).

(1) 396 mgm. Ag_3Sn = 40 cmm. at 5 per cent. expansion give +2 cmm.

(2) 312 mgm. Sn with 78 mgm. Hg form 390 mgm. $Sn_{80}Hg_{20}$ (ideal specific volume 0.124); = 50 cmm. at 1.5 per cent. expansion give +0.75 cmm.

(3) 288 mgm. Ag combine with about 350 mgm. Hg to form 638 mgm. Ag_3Hg_2 (ideal specific volume 0.083) = 53.12 cmm. At 5 per cent. contraction the result is —2.66 cmm.

Result: 2.75 cmm. expansion, 2.66 cmm. contraction, give 0.09 cmm. expansion for 150 cmm. volume, or 0.0006 per cent. expansion.

It is to be remarked that in the proportion Hg 40, filings 60, 20 mgm. Hg are missing. For perfect amalgamation this mixture therefore needs correction. The latter alloy, however, as compared with the former, has the preference of a fusing-point of 200° C. lower, and in my former essays I have showed how this fusing-point can and must be still further reduced. Thus the basic factors of our science of amalgams should be sufficiently elucidated to furnish us with a clear and mathematically exact concep-

tion of the processes involved in the formation of amalgams.

A discussion of the still open questions as to the effect of the metals used as corrigents in the formation of amalgams and the possible formation of ternary and quaternary combinations is reserved for the future.

These investigations have been carried out in the Institution for Physical Chemistry of the University of Göttingen. The author is greatly indebted to Privy Councilor G. Tamman for the assignment of laboratory facilities and various helpful advice.

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THE QUESTION OF MEDICAL EDUCATION FOR THE DENTIST.

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(Read before the Susquehanna Dental Association, at its forty-sixth annual meeting, Harvey's Lake, Pa., May 18, 1909.)

FROM the remotest times the records of the development of dentistry as a special calling show that there has existed a diversity of opinion concerning the relationship which dentistry should bear to general medicine, and much controversy has been indulged in from time to time as to whether a dentist should be a graduated physician with a special dental training, or whether the dentist shall be specially educated for his profession regardless of the medical qualification.

Much prominence was given to the discussion of this question during the formative period of dentistry as an organized profession in 1839, when the first college for the systematic education of dentists was established in Baltimore, and at no time since has our profession been without members who have held and advocated views antagonistic to the principles of education for which the first dental college and its successors have consistently stood. This antagonistic attitude has recently found expression in articles by E. S. Talbot, which are an arraignment of dental education, as now conducted, so severe and drastic that if true they can only lead to the conclusion that dental education as a separate system is a failure, and because of its faulty fundamental premises has been a failure from the start. It seems important, therefore, that we should inquire into the facts of the case, and discover, if possible, whether dentistry in the seventy years of its organized professional existence has justified its position, and if so, whether it is likely to continue to justify its existence in the future by pursuing the same policy as to its separate educational system independently of the medical curriculum.

The essence of Talbot's argument is that dental education is a failure because the products of its operation are not capable of intelligent practice; in short, that dental education does not educate because it fails to give to the graduate that grasp of the larger biological questions which are at the base of medical science; that as a consequence we know nothing of the scientific groundwork of physiology and of pathology, and lacking this knowledge we are incompetent as therapeutists; that our treatment is empirical and not rational, that we have run only to mechanics and are not doctors but "tooth carpenters." As a panacea for this deplorable state of affairs, it is proposed that hereafter we undertake to make dentists by first making medical men, and after the medical diploma has been earned teach these medical doctors, or as many of them as want to submit themselves to the process, the intricacies of the science and art of dentistry.

The history of medical science clearly records the fact that in its early development medicine was an art practiced by the priesthood. The priests were sought not only for their intervention in those affairs which concerned the souls of men, but those sick in body as well were brought to the priests to be healed, so that the sacerdotal function and that of physical healer became united, and so remained for many centuries, with the result that these priestly physicians secured for themselves and their profession an overwhelming control over the affairs of men, and produced an impression as to

their importance upon the mind of society which remained long after the functions of the priest and those of the physician were separated—an impression which survives in modified form even to the present time.

Reference is here made to this historic attitude of the votaries of the healing art toward society for two reasons; first, because it serves to explain why it is that organized medicine has from the beginning endeavored to monopolize for itself and comprised within the powers and meaning of its degree of M.D. the whole range and territory of the art and science of healing; and second, it serves to explain how it has come about that the social status of the medical man is what it is, second in importance to that of no other member of society.

SOCIAL RECOGNITION AND THE DEGREE.

With these two points in mind it is not difficult to understand why it is that there are always certain members of the dental profession who for various reasons practice dentistry for a livelihood, but who are dissatisfied with their professional and social position as compared with what they think both of these might be if they were medical men instead of dentists.

Talbot voices this complaint exactly when he says,* "A poorly educated practitioner with an M.D. degree always stands better in a community, both socially and professionally, than the best educated dentists with a D.D.S. degree only. This is and always will be the case, since the medical profession will never recognize as an equal a practitioner with the badge of an inferior degree. This argument has been recognized and reiterated many times even by dental teachers."

No stronger symptom of the etiology of the "stomatological" mania could be asked for, but what a commentary upon the respect which a man ought to have for his own calling! and what a flood of light it throws upon the deplorable fact that there are so many poorly educated practitioners with the M.D. degree trying to practice dentistry in the community —men whose first care, if we accept the statement thus quoted from Talbot as correct, must be their social and professional position, and whose professional service to their patients is therefore a secondary consideration.

But as a matter of fact it is not true that the social and professional position of "a poorly educated practitioner with an M.D. degree in a community is better than that of the best educated dentists with the D.D.S. degree only." Such a statement is an insult to the intelligence of the average community. Men make their social and professional position in any community according to their individual merit, and the records of dentistry are full of instances where the social status of certain of its members has been as good as that of any physician and better than most. The M.D. degree does not, *per se,* give a man social position, though it does give him the opportunity to earn it, and so does any degree or no degree at all. What the medical profession thinks of the dentist professionally or what the community thinks of him socially is the question of his professional and social excellence and nothing else, and these same considerations determine also the status of the medical man or of any man. These being the facts, let us once and for all dismiss the puerile contention that a medical degree is of itself either a badge of culture or of social caste.

THE MAIN QUESTION.

The question of medical education for the dentist from a practical standpoint resolves itself into giving him so much or that amount of medical education necessary to fit him for his work as a dentist. And what is his work as a dentist? To give an inclusive definition of dentistry is as impossible as it is to give an inclusive definition of medicine—impossible because the science and art of heal-

* "Sense and Nonsense in American Dental Schools," Cosmos, April 1909, vol. xli, page 424.

ing is continually undergoing development; it is a living thing, so that a definition which would be true today would be insufficient tomorrow. Similarly, because the points of contact between dentistry and general medicine are in many directions so close that it is impossible to draw any dividing line between them. This condition arises from the fact that dentistry is a special department of the great science and art of healing, which in general terms is comprised under the designation of medicine. The demand that the dentist shall be medically educated in the sense that he shall pursue the course of study which will enable him to acquire the M.D. degree is based upon the fallacy that such a course and its distinctive degree is evidence of his fitness to intelligently practice the healing art in all its branches, or possibly with the exception of dentistry, in which case this latter deficiency can be made up by a slight additional training in special dental work and study.

The curriculum of study leading to the attainment of the medical degree, at least in American medical schools, is wholly inadequate to train a man so that he can intelligently practice more than a small fraction of the science and art which the medical degree professes to represent. As a consequence the new medical graduate issues from his school at commencement day with but a smattering of medical culture, yet he is armed with a diploma and license which authorize him to practice in any or all departments of medical work as he may elect to do, and the sentiment of the community, which is the historic and conventional attitude of tolerance toward him and his craft, defends and supports him in his failures and ignorance in any and all cases short of wilful malpractice. The honest and conscientious medical graduate clearly recognizes his need of further training and the insufficiency of his college course as well as the hypocrisy of the certificate of his attainment as attested by his diploma, and to make good his reputation as well as to sustain the public credit of his professional degree voluntarily addresses his energies to further self-culture, which he acquires through post-graduate work, before his conscience, and to some extent public sentiment, will permit him to undertake the responsible mission of caring for the lives and health of the citizens of his community.

Medical science and art long ago outgrew the limitations of a curriculum which undertakes to qualify a man for medical practice after four years of college training. The M.D. degree is today an "inferior degree," because it is, relatively to what it theoretically and popularly represents, the badge of a partial culture. The science of medicine has outgrown both its curriculum of preparatory study and the degree which represents the completion of that curriculum.

Dentistry has been more honest in its educational scheme. The makers of dentistry are the men who have been educated under a curriculum of study which has had for its object the making of qualified dentists from start to finish. It has concerned itself with the questions of professional status and social recognition only in so far as these desirable features are to be attained through excellence of result professionally and of excellence of character socially. These attributes have not been sought to be secured through the hypocrisy of borrowed medical plumes or the artificial aid of a misfit degree. These men have never been ashamed of their calling nor have they ever apologized for the fact that they were dentists. They have deplored the fact that there have been and are now, as always, in the ranks of qualified dentists many who are a disgrace to their profession, and they have equally deplored the fact that among its educational institutions dentistry has instances of so-called colleges run for personal gain or the aggrandizement of those connected with them. It is easy but wholly unprofitable to discuss the defects of our system as compared with that of medical education, for the reason that investigation would quickly reveal the fact that the defects chargeable to the one would be easily duplicated in the other. What is of importance for us to note, however, is that dentistry as

we know it and have it today, the dentistry which we are proud of because it has fairly won the respect of all humanity, save a small fraction thereof who want to be physicians and who can't get into medicine through the dental door, is the dentistry which is the result of a special educational system having for its object the making of dentists, and not of medical men with a dental educational appendix.

But let there be no misunderstanding in regard to the necessity for medical education for the dentist. Dentistry within its province is the healing art, and proficiency in its practice necessitates a knowledge of those subjects which are fundamental to the whole science and art of healing. The fallacy of the argument of those who demand that the dentist shall acquire the medical degree is the assumption of divine right on the part of medical teachers to impart instruction in the so-called medical branches. Anatomy, biologic chemistry, physiology, bacteriology, and their subdivisions and correlated branches are sciences, subdivisions of the great science of biology which are utilized in the curriculum intended to fit men for medical practice. So also they are used in the curriculum intended to fit men for the practice of dentistry, and we must get rid of the obsession that these subjects are medical subjects in the narrow sense that they can be monopolized by the medical curriculum. The dental curriculum must grow and develop by the addition from time to time of any and all subjects which will more efficiently educate the dentist for his work, be that work practice, teaching, or original scientific research, and as the general knowledge of the science and art of healing continues to expand it will necessarily follow that more of the subjects commonly denominated "medical subjects" will be included in the dental curriculum.

We must never lose sight of the fact that the best way to make a dentist is to make a dentist, and with that object always in view let us give him all the "medical education" he can utilize in his work, but never, in the name of logic or honest, practical common sense, begin by making a physician of him, especially from the mistaken and dishonest motive that it will give us better social and professional status—in short, make us more respectable!

"WHAT WE HAVE TO GIVE."

By PAUL G. WHITE, D.M.D., Boston, Mass.

(Read before Section III of the National Dental Association, at the annual meeting, Birmingham, Ala., March 31, 1909.)

THE wealth and general prosperity of a nation or people depends largely upon a condition of healthfulness in both body and mind, both assets of great value. Whether mankind has deteriorated in these valuable attributes with the advancement of civilization and our modern methods of living is now a greatly discussed subject. Evidently the pioneers of this country of ours, those who cleared the vast forests and developed a great wilderness into this beautiful and fertile land as it is observed by us today, were a class of men with a physique and health with which the present generation is unfamiliar. And the women of that period, who shared in the hardships incident to those times and cared for the large families of children which were of common occurrence, must

have required the best possible physical condition. If this is a fact, we must acknowledge that civilization and modern methods of living have something to do with our physical development and the general state of being healthful both in body and in mind.

Observations have led us to believe that human beings will pay attention to almost anything under heaven rather than to their own bodies and health, and in the work which we have in hand our advice seems perhaps to fall on deaf ears. The great majority have been taught along old-fashioned medical lines such as these: "Eat what you like, everything that tastes good; live as you want to, and then when you are sick, as of course you will be about so often, call on me and I will open my pill-bag and 'cure' you at so much per."

Millions today honestly believe that if drugs, chemicals, medicines cannot cure them, it is the will of a loving Father that they should die. To offer to these millions a means of perfect health which is entirely removed from drug superstition is to speak to them in a new language. To point out to them their errors and try to set them right without giving them something in the shape of drugs is considered useless, and one is put down, I suppose, as being somewhat queer.

We must sympathize with this ignorance. It is the stone wall against which truth and health dash themselves to pieces, and this wall *must* be torn down. We must not adopt the easy "let alone" policy, for mental, moral, and physical degeneration is sure to come just as soon as mental, moral, and physical advancement stops. It is for those who know to say whether humanity shall advance or retrograde. That is the question we must answer; it is ever before us. What shall we do? We have the possibility of teaching the young, because we know that perfect health depends upon neither pills nor prayers, but upon an intelligent following of the rules of correct living. Each of us becomes a little center of light out of which gleam the rays which will eventually enlighten the world, now in darkness. Shall we hide our light? is the old question. The answer is: *No!* let that light shine, whether it be only one candle or an immense arc-light—it will do much to dispel the gloom.

We must talk to the people. When a man stops talking, he is soon forgotten. The same is true with a cause. Few great names or great causes rest upon one message to the people. Whether they be embodied in a book, a poem, a speech, some of the world's greatest truths are great because of their repetition. For people forget; each day begins anew, and the story told yesterday must be told today, differently, perhaps, but nevertheless told again. It is the story told day after day that makes its point felt.

The public learns like a child, by repeating a name, a phrase, a sentence over and over until it is known. Let us start the public on its lesson now. Let it see our cause exploited daily, every other day, twice a week, until it is learned. Let the light shine on!

As the oral cavity has been fittingly called the gateway of life, so may oral hygiene be correspondingly styled the gateway to health, or the key to all personal and domestic hygiene. As personal and domestic hygiene are closely related to sanitary science, this same key may open the way to a larger and broader domain of state and municipal hygiene. Oral hygiene may be defined as that subdivision of general hygiene which treats of the care and proper use of the mouth and teeth. As the healthy body depends upon the air which it breathes and the food which it assimilates, and as both of these are directly affected by the conditions existing in the oral cavity, it is not an exaggeration to say that three-fourths of the ills of mankind would be —nay, will be—banished as soon as the mouth and teeth receive the care and attention they require.

The great important question which arises here is, How is this care and attention to be brought about? The answer is, By educating the public. And then again the much-mooted question arises, How?

Since the mind of the adult is not

as susceptible as is that of the child, even if the instruction be given properly, and since it seems almost hopeless to attempt to reform the adult, our entire efforts should be directed to looking out for the future generation. Inasmuch as it has been convincingly demonstrated by statistics that the family cannot be relied on to safeguard what may be considered one of the most vital physical functions, it devolves on the schools to inculcate habits of oral hygiene. As Dr. Grady says: "Is it not the duty of the school to arouse society to intelligent thought on the importance of better modes of life? Is it not the duty of the school to train people to live better—is not this the true purpose of the schoolroom? The logical place to begin is with the physical life of society—the one phase of life that has been most ignored by our educational methods."

We must stop at its source all this mischief. There are more than 20,000,000 school children in this country, one-fifth of the entire population, and hardly a child among them that has no defective teeth; and among the other four-fifths of the population there is scarcely one man or woman who has never had need to employ a dentist. These same conditions prevail throughout the civilized world. Dental caries is a disease of civilization, and how to check the havoc which it is working upon humankind is one of the serious problems of the day.

The presence of bacteria within or upon the human body, the transmission of disease germs from the sick to the well, is but one of the factors which tend to cause disease. A lowering of body resistance is the first step, and here disease finds its opportunity. The healthy body has the power of resisting disease, but a body cannot be healthy with a foul and neglected mouth.

It would be a waste of time to repeat to you, who know them so well, all the complications which are often ascribed to dental disorders; suffice it to say that too great stress cannot be laid upon this question. There is not a disease to which the human body is liable that is not aggravated by an unhealthy condition of the mouth; in fact, many diseases are originally caused by neglected teeth. Health is impaired, beauty marred, happiness destroyed, and life shortened by the deplorable ignorance of the hygienic laws governing the preservation of these important organs.

In my opinion, it can be said with perfect truth and without serious fear of contradiction that our public schools have served as an incubator for the developing and the disseminating of more disease than any one single cause known. The number of deaths due to such causes, if the truth were known, would certainly be appalling.

In some states compulsory education is a part of our public school system, and tardiness and irregular attendance are not tolerated. To compel a child to attend school, and to subject it to infection that may result in sickness or death, if such conditions are known to those in authority, is absolutely unjustifiable—is nothing short of a crime.

There is yet a weightier reason for legal insistence upon proper instruction in the care of the teeth in the schools. Many thousands of dollars are expended each year for systems of school ventilation, and the people cheerfully bear this burden of expense because they are convinced of the need of keeping the air of rooms in which children are brought together as pure as possible. But, strangely enough, school authorities have thus far overlooked the important fact that the pestiferous odors issuing from neglected mouths are rendering the problem of ventilation almost impossible of solution. How much money, and what is of greater importance, how much health might be saved by intelligent attention to the laws of oral hygiene!

If there is any country in the world where such conditions should not have been permitted to exist so long without being detected it is our country, where state laws declare that whatever else is done with a child's time in school he shall be taught hygiene and physiology. To these subjects alone is given right of way for so many minutes per week, or so many pages per text-book, or so

much of each chapter. For failing to teach this subject with the frequency prescribed by law, teachers may be arrested, fined, and removed from office. Yet in spite of laws in every state and territory, and in spite of the army of publishers' agents ready at a moment's notice to jump to the defense of these laws, physical defects and unhygienic living are quite as common here as in countries where opposition to alcohol and tobacco is not strong enough to influence legislation. The chief purpose of school hygiene has hitherto been not to promote personal or community health, but to lessen the use of alcohol and tobacco, and there is not a single physiology or hygiene book used in the public schools today that contains a chapter on oral hygiene, which should be the longest and most important in the whole book.

Although it has been repeatedly denied, we are all aware that a feeling of jealousy exists between the physician and the dentist, which will continue just as long as these professions are taught separately.

This fact strikes us as being more natural than that there should exist a feeling of jealousy between the dentists themselves. In a certain section of this country—and I suppose the same applies to other sections—when a petition was being circulated to establish oral hygiene in the schools, dentists repeatedly refused to sign it, always raising the question, What are you trying to get out of it? or, Your theories are all right, but not for me; I am not going to ruin my business. This movement did not stop here, however, but continued and increased, until a feeling of jealousy sprang up and became more evident between the colleges. Many refusals came in the form of an answer similar to this: It is a very good idea and surely ought to go through, but as you are not a member of our college (as my college is doing work along this line), I cannot sign your petition. I believe in loyalty to our alma mater, its interests and advancement, but I believe that our first consideration should be given to our profession. Just as long as this petty jealousy exists, just as long as our profession is divided, just so long will our advancement and interests and the welfare of humanity progress slowly, but if we are once united, working for each other's interests and a worthy cause, success is ours. It will come about, perhaps slowly at first, but surely, as the truth dawns upon us, that every board of health shall have its dental member, every hospital, prison, and reformatory its dental department, the army and navy its dental surgeons, and every school its inspector and instructor in oral hygiene; and better still, the mortality rate will be decreased over fifty per cent.

It has been said that organization makes the vast difference in effectiveness between a mob and an army. The dental profession in the United States is a mob. It lacks the inspiration, the discipline, and the unity conferred by a thorough and effective organization. Its many associations interest but a moiety of the profession. They are independent units, each going its own way with but little regard or concern for its fellows. Our dental profession has no controlling or directing head. It has no mouthpiece. It has no systematic means or methods for reaching its scattered members or those who newly enter its ranks, to interest them in matters concerning the profession.

Specialists in medicine are prone to overestimate their importance, but dentists seem to be an exception. The far-reaching relations of dental health or disease to health or disease in general are as yet very little appreciated. How, then, may they be appreciated? Will dental examinations bring this about? Perhaps, but with the best result? No! Cities and towns are not as a general rule in position financially to undertake the proper care of school children's teeth, and even if they were, it is a mooted question whether that would be the best way out of the difficulty.

In the model dwellings built for the indigent poor of London, a tour of inspection, six weeks after the tenants moved in, revealed the use of porcelain bathtubs as coal-hods, the plumbing stopped with swill, etc. It is the same

with the teeth. To put the mouth in good condition for a child who has no habits of dental cleanliness would be ill-advised charity, and before we can help this class they must be taught their own duty to themselves. This, then, means a course in oral hygiene by means of text-books or lectures. While lectures are productive of much good, they only reach a comparatively small part of the population, whereas a course in oral hygiene would permanently affect the entire generation.

The want of a suitable text-book, however, makes us rather timid about approaching school authorities, and it seems to me that this can only be rectified in the following manner:

Perhaps the reading of two letters will illustrate my plan of campaign. As a member of the Oral Hygiene Committee I have written to a number of authors of the physiologies and text-books on hygiene used in the public schools of this country the following letter:

Dear Sir,—As there is at the present time no hygiene or physiology used in our schools or colleges which contains a chapter on oral hygiene, I am writing to ask if you would be willing to have incorporated in your book, ————, a chapter on oral hygiene, compiled and copyrighted by the National Dental Association. We are endeavoring to have oral hygiene taught in every public school in the Union, and this seems to be the only way to obtain a uniform course of instruction. I should be glad if you would make any suggestions in regard to the same.

Sincerely yours,

PAUL G. WHITE.

A reply from Seneca Egbert, one of the leading hygienists of this country, reads in part:

Shortly after receiving your letter I consulted my publisher as to the advisability of your proposal, and found that he was quite willing to consider it seriously. He suggested that it might be well to ask you to send on the manuscript of the proposed chapter, so that we might judge not only of its subject-matter, but also as to how much space it would take. As I understood it, there is not much likelihood of there being another edition of my book issued this year, but the publisher suggested that your chapter might go in as an insert in copies not yet bound just before the index, together with an explanatory paragraph or two.

Yours sincerely,

(Signed) SENECA EGBERT.

Do not these letters bring out the way to introduce oral hygiene all over this country in the shortest possible time, and without the objection by school boards, boards of education, legislatures, etc., on account of expense? I therefore wish to ask that the National Dental Association vote authority to the Oral Hygiene Committee to prepare this chapter, and to give them power in the name of the National Dental Association to carry out this plan.

As Dr. Osler says, there is nothing more important to the public in the whole range of hygiene than oral hygiene, and it is the most important work the National Association can ever attempt. The suggestion of Dr. Corley made last year that the state associations create standing committees to act as subcommittees to the National committee, with such changes and modifications as may be thought best to meet the needs of their special field, and that they submit an annual report to the National committee, is an absolutely necessary one to further the work of the association; for without such co-operation of what real use is a National Dental Association?

Some people are as afraid of a new idea as a tramp is of soap. They will not look it squarely in the face until they are compelled to, and then will search heaven and earth to find a reason why it is not so. Some people use a gold pen and only write in mud. I would gladly use a steel pen and send out words of living fire—words which would stir to flame the ashes upon many a dead heart.

Do you realize that the National Dental Association should stand for all that is uplifting, ennobling, and glorifying in our profession? Can you name a calling which is more beneficial to humanity?

Are you interested in measures to suppress the great white plague, killing an-

nually 132,000 of our brothers in the United States alone? Do you want your voice to be heard on this question? Are the facts of society, state, and nation of interest to you? Are you on the side of right in the movements for the abolition of disease?

Do you say that the rule of quacks shall end? Are you down upon frauds in politics, religion, and medicine? Are you ready to put a little muscle behind the wheels of progress? Do you really want to make the world a little better because you have lived?

If you say, Yes; yes; yes, to all of these questions, then I say, Your place is where there is a practical, permanent organization working to accomplish results. We must do things. There must not be one single lazy man in the National Dental Association. We are going to enjoy heartily the atmosphere of accomplishment. Do *you* want to catch the contagion of success? Then let those that are not members of the National Dental Association join the ranks now, for we are on the march and cannot stop for anyone!

DENTISTRY, PAST AND PRESENT, AS SEEN BY A MODERN HYGIENIST.

By Dr. L. C. TAYLOR, Hartford, Conn.

(Read before Section III of the National Dental Association, at its annual meeting, Birmingham, Ala., March 30, 1909.)

IT is not our purpose to discuss this subject further back than our personal recollections go.

In the early sixties, I well remember a friend who studied dentistry, such as it was then looked upon, for three months, and served for three months more as an assistant to his preceptor. During another three months he opened an office in a small country town, where he made more money than I did, which gave me the impression that dentistry must be a lucrative business, and I determined that there must be my opportunity. Being of a slow nature and persuaded by my preceptor that I should spend more time, I devoted eighteen months to study before I went forth as a high-class practitioner. To clean a set of teeth and receive fifty cents was considered but little better than highway robbery by the public, and as it was done in those days, I am inclined to think that the public was judging correctly. It is my opinion, based upon long experience, that you can depend upon the common people to judge well of our teachings. The dentist is a teacher, and the value of his service will depend upon his ability to teach and demonstrate. To simply tell a patient that he needs a filling here or there, or to tell him that he must clean his teeth and use some particular mouth-wash, is of very little value, because the whole proposition is vague and carries but little meaning to the mind of the patient.

Rubber plate work was at that time considered *par excellence,* as the exquisite gold-plate workers were going off the stage of action. Filling teeth in those days was of but little consequence, as most fillings would be in the scrap-heap in from six to eighteen months, and the man who could not make from six to ten fillings in an hour was considered too slow. An occasional soft foil filling that had remained in the mouth for thirty years was considered proof of their being the proper fillings, although usually

the environment had been changed so that the filling had little to do with the preservation of the tooth.

The foregoing is a graphic picture and a fair one of what existed in the early sixties; but before 1870 a marked change set in. The treatment of septic teeth was much discussed, and there seemed to commence a progress in the healing art that will, in time we hope, relegate the turnkey and the forceps to the railmaker, as the public becomes better educated in some of the health problems of which dentistry, with its advanced meaning, seems to be the keynote.

During the seventies, I well remember how we all listened to that famous teacher and scholar, Dr. Atkinson; how vigorously he combated the then quite common V-shaped separations advocated by Dr. Arthur, which had left such favorable impressions upon the minds of many as producing a better sanitary environment.

The above, coupled with the extraction of first molars as taught by Dr. Riggs, was considered by many to be a most excellent sanitary treatment. When we consider that these men had no engines and very few instruments to open up septic roots, we must be very considerate in our censure, as all teaching up to that time consisted in instruction as to how to fill roots with medicated cotton, which was forcibly impressed upon young men by our famous and much-beloved Dr. Flagg.

Dr. Atkinson's exceptions to all these teachings caused him to be sought to teach in all New England conventions. While he was even more erratic than any of our teachers before or since, he taught that thorough disinfection should be followed by complete filling of roots with an insoluble substance, and the restoration of the full contour of the tooth-form by a gold filling. In the Connecticut Valley Dental Society, when Dr. Atkinson was advocating the building up of a full gold crown on a molar root, he was asked if he could get pay for such work. His answer was: "Five times in my life I have charged as high as seven hundred and twenty dollars for a single filling." Gold caps soon came to our relief, and the necessity for such fees was obviated. Gold caps, during the eighties, led up to a system of bridge work which has gratified the ambition of many mechanics even to this late day. The question of sanitary environment and bridges has differed according to the teachings received by the different practitioners. That most bridge work is unsanitary all will probably agree, and while in some cases it is of benefit to the patient when well cared for, I believe that nine out of every ten pieces have been a curse rather than a blessing. If our schools would spend three-fourths of the time devoted to bridge work in teaching oral hygiene and prophylaxis, we believe they would be serving the profession and the public much better. When young men, college graduates of four or five years ago, say that they never heard the terms oral hygiene or prophylaxis used in the whole three years of their school life, it is useless to claim that the schools are doing their whole duty.

There is no doubt that the teachings of 1890 to 1900 are producing better methods of practice along the line of oral hygiene, as oral hygiene is not only reaching the dental profession, but is also marking a special chapter in the history of the medical profession as well.

Dr. Tracy, the famous gynecologist, says: "The surgeon who considers the welfare of his patients must examine most thoroughly every part of the body before undertaking any operation. In following out my work along these lines, I am impressed more and more each day with the lack of regard the average patient has for the condition of the teeth and the cleanliness of the mouth. That such a condition exists is due to lack of education in this direction, and the people largely responsible for this state of affairs are the dentist and the clinician. . . . . The dentist is looked upon by the public in general as a man who fills teeth, extracts teeth, and makes artificial teeth. In other words, he is looked upon as a mechanic who has no part in the practice of medicine. And I regret to state, judging by the superficial, care-

less manner in which many dentists do their work, it is evident they consider themselves in the same light. When the dentist realizes that he is a specialist in one of the most important branches in the practice of medicine, combines this principle with his mechanical ingenuity, impresses upon his patients the importance of thorough dentistry and of oral prophylaxis, then will he be practicing his profession as he should, and will be regarded by the community at his true value. . . . The person who is really responsible for the terrible condition in which we find the mouths of many patients is the clinician. . . . That infection of the mouth may play an important part in the production of disease in the gastro-intestinal tract or in other parts of the body has largely escaped the medical profession. . . . Dr. D. D. Smith read a paper before the Philadelphia County Medical Society some six years ago in which he calls attention most forcibly to infections of the mouth as a cause of disease in the gastro-intestinal tract. . . . Dr. Smith stated he had seen disturbances of digestion, nervousness, irritation of the kidneys, and many other abnormal conditions cured by no treatment other than disinfection of the mouth. . . . Dr. Register states that he has seen many cases of gastric catarrh associated with pyorrhea alveolaris cured by thorough surgical treatment of the mouth."

Dr. Tracy further says: "Who could wish for a more rational explanation for a gastro-intestinal disturbance than a constant infection from a purulent mouth? The more attention I give my patients as regards the condition of the mouth, the more I am in accord with the position taken by Smith, Register, and other writers upon this subject. . . . The risk of operating upon such a patient is greater than if the mouth were in a healthy condition. . . . A patient whose mouth is in the condition already described will absorb a certain amount of toxins, which will lessen the resistance of the tissues, change the chemical composition of the blood, and will predispose the subject to many diseases."

That Dr. Tracy has reached a sane and rational conclusion, I do believe. That the alimentary tract from the gums onward is affected by septic deposits on the teeth has been clearly demonstrated in my own practice of many years. While the green stain found on young people's teeth is very pernicious to the health of the child, it is usually visible and easily removed by the exclusive use of hand instruments, and health is restored almost within three days, while an attempt to restore health by the use of a germicide is of long duration, and even then of doubtful results. When we see the festoons of the gingivæ slightly elongated, the teeth comparatively clean, the soft palate red and angry, we may know that the trouble lies under the festoons, and after removing the coating and stirring up the gums to a healthy action we will see the redness of the soft parts disappearing, and in a year's time the patient will probably tell us that his rheumatism is better. One lady in my practice remarked that she thought it very strange that she had doctored eight years for rheumatism, and then went to a dentist and had it cured. The cause lay in the mouth, and no amount of medicine would ever have cured the case, whether administered to the stomach or used as a mouth-wash. There were within that mouth the poisons that caused derangement of the stomach, and until these had been removed no cure was possible. Germicides and mouth-washes do not reach the seat of trouble; something more than prescribing this or that remedy is called for. Nervous dyspepsia can be cured in almost every instance by reasonable treatment of the mouth without medicine.

The natural tooth-brush is the tongue, but owing to the use of soft foods the tongue becomes inactive, and in many instances patients seem to have lost control of the tongue. Not only have they lost control as far as cleaning the teeth and stirring up the friction on the soft parts are concerned, but also in regard to articulation. Will you tell me what has become of the orators of thirty years ago? Many men and women spend large

sums of money to be able to write a fine essay that will read most beautifully, but when they are asked to deliver it before a public gathering, their address or sermon is remunerated by a sleepy audience because their mouth has become so inactive from neglect.

Irregularities are a source of ill conditions that is much to be regretted. Many of our present orthodontists are rendering good service, and the constant treatment of the mouth for the correction of irregularities so massages and hardens the mouth that the patient is greatly benefited. I sometimes think that the manipulation which a child receives in such cases is almost as beneficial as the correction of the deformity present.

I once heard it said: "As a man's head is, so will his body be," and from careful observation I am inclined to believe in the truth of this remark. Observe how every man who breathes naturally through the nose has a normal occlusion of the teeth without any irritating factors, and a well-balanced brain: and see if you do not find a healthy body in every such instance.

I may seem to be wandering a little from my subject, but dentistry of today must not be limited to mechanical changes that may be made on the teeth alone. It must be considered as reaching well up into the field occupied and supposed to be monopolized by the rhinologist, and in some instances it must even prevent the necessity of further operations.

Why is it that so many eminent and learned men are called scientists who spend some years with the microscope studying the nature of and naming the millions of germs in the mouth, and then tell us that we must use their particular mouth-wash—which is soon captured by a business man who heralds it from ocean to ocean? Has any one of them ever been successful in restoring the mouth to health? That the hypnotic suggestion has caused many to begin a course of cleanliness that has resulted in good, no one doubts, but it was the massage and the hardening of the mouth that caused the betterment, and not the therapeutics. That filthy mouths are loaded with millions of germs no man will deny, and under such conditions the mouth is soft and tender. The hardening of the oral soft tissues will produce a change and clear the mouth of germs, or in other words, the germs will not linger in a mouth that is subjected to strenuous usage.

The filling of teeth, executed well or badly, has occupied the time of the majority of dentists, and today is looked upon by some as being more remunerative than modern prophylaxis. The reason for this is that most practitioners clean off the teeth a little, prescribe their favorite mouth-wash, and call it practicing prophylaxis, while in reality their prophylactic treatment usually produces only partial results.

The modern hygienic filling is another step in advance. By this I mean cement with gold built into it while it is still soft, allowing the cement to form the joint clear to the enamel edge, the gold being a protection to the cement. These fillings will do more toward the preservation of teeth than almost any other method of filling that is in use today, as they are practicable everywhere, which cannot be said of inlays, whether porcelain or gold, both of which depend on the cement for the saving of a tooth. The adaptation of the inlay requires so much waste of tooth structure that it is rendered impracticable, except where there is open access. I believe that inlays are desirable in many instances, but the proportionate number of such cases is only about one to ten as compared with the hygienic filling. The effort to save teeth with gold or amalgam alone is being abandoned by all conscientious and progressive practitioners.

The age of preventive treatment is ours, and he who has spent his life patching up waste already consummated is not the one whom the public holds in requisition. Preventive treatment, both in medicine and dentistry, is sought on every hand, and if we do not heed the call, our friends will.

ENAMEL SOFTENING AND REHARDENING AS A FACTOR IN EROSION.

By JOSEPH HEAD, M.D., D.D.S., Philadelphia, Pa.

(Read before the Dental Society of the State of New York, at its annual meeting, Albany, May 6, 1909.)

UP to the present time enamel softening has been considered to be necessarily associated with roughening of the surface, loss of luster, and dissolution of the cemental substance that binds the enamel rods together; and whenever enamel decalcification is associated with decay of dentin this conception of enamel softening is only too accurate. But may not this conception be only a part of the story, so to speak—the final part rather than the complete process of enamel degeneration? It is with that idea that I now report the results of the experiments contained in this paper.

Miller and many others in producing artificial decalcification by solvents, in employing water solutions of acids varying in strength from one-half to two per cent. have exposed their tests to two serious objections: First, that the solutions found in the mouth are saliva solutions, not water solutions; and second, that any strength greater than 1 : 1000 of lactic acid or any similar acid would be so abnormal to the taste as to render the patient a fit subject for a hospital or a dime museum. Unquestionably, the acid set free from the bottom of a bacterial plaque adherent to enamel may be acid of any strength, possibly c. p., or there may be developed in a cavity, where the opening into the mouth is small enough to prevent dilution with saliva, acid of almost any strength. But in the enamel degeneration which is associated with general erosion, where the bacterial plaque is not an important factor, decalcification tests, to be of value, must be made with saliva solutions, and with not only strong acid solutions, but with acid solutions as weak as are found in the human mouth; for saliva itself restrains the action of many acids on the teeth and modifies and changes the appearance of enamel decalcification.

For instance, 1 : 1000 lactic acid and water at mouth temperature will cut tooth enamel in thirty minutes with a rough, white surface. A tooth placed in 1 : 500 lactic acid and some salivas will be unharmed. In this solution made with other salivas, after three or four days the enamel of a tooth, though perfectly smooth and to all appearances normal, can readily be pared to a slight distance with a lancet, and yet a 1 : 500 saliva and lactic acid solution has an extremely acid taste and instantly turns litmus brilliantly red. A 1 : 20,000 lactic acid and water solution will, at the end of three or four days, leave the tooth enamel unharmed to all appearances, and yet the outer surface of the enamel will, with the edge of the lancet, be found to have distinctly softened. A 1 : 500 lactic acid solution with my saliva, although the solution has a decidedly acid taste, will produce this identical effect. The appearance of the enamel is unchanged but sufficiently softened to the cut of a lancet, although before the tooth has been immersed the lancet is unable to make any impression upon it.

The action of water solutions of acid calcium phosphate and acid sodium phosphate on the teeth has been mentioned by Kirk, stress being laid on the fact that these salts cause smooth white decalcification. As a matter of fact, many

acids in water solutions cause smooth primary softening, if the solution is sufficiently weak. Saliva ordinarily restrains the action of most acids up to a certain point, and then begins with the smooth decalcification and ends with the same rough white decalcification that we find in a water solution. The saliva solution is ordinarily ten to twenty times weaker in its action on enamel than is a water solution of the same acid strength. The acid sodium phosphate and acid calcium phosphate are, however, intensely interesting in their action, not only in water solutions, but in saliva solutions. Acid calcium phosphate 1:5000 water solution, and acid sodium phosphate 1:20,000 water solution at the end of two days will turn tooth enamel into a cloudy, pearly white, with a clear smooth surface. This surface is distinctly softened to the cut of a lancet. If, however, these teeth are removed from the solutions before the process advances too far, the cloudy appearance will in time disappear, and the tooth enamel will resume its normal appearance. This phenomenon occurred many times, but once when I re-tested the hardness of these teeth with a lancet, I found that not only had the white color disappeared, but the superficial softening of the enamel had disappeared also. At first I attributed this disappearance of the softening of the enamel to previous faulty observation, but the same phenomenon occurred in my lactic acid test. A tooth that had been placed in a 1:20,000 lactic acid watery solution, at the end of a few days was slightly softened to the cut of the lancet, but a month or so later the lancet would not cut it. It was then that the possibility was made apparent that partially softened smooth enamel could reharden itself, if the decalcification had not progressed too far.

I then made the following test: Two sound teeth with enamel impervious to the lancet were each placed in a lobe of a navel orange. These lobes were each placed in a bottle with a few drops of ether to prevent fermentation, and kept at body temperature for two days. At the end of that time the teeth were removed and examined. The lobe around one of the teeth had fermented, the lobe around the other had not. The tooth in the fermented lobe showed a smooth, white, translucent area of decalcification, running from the cutting edge to about one-third of the distance to the neck. The rest of the enamel was normal to all appearances, and yet the surface, both of the white and the apparently normal enamel, was readily pared with a lancet. The lobe in which the other tooth was embedded had not fermented, and the enamel also seemed normal, but here again the outer surface of the tooth enamel was distinctly softened. These teeth were then washed in water and kept in some of my saliva at body temperature for two weeks. At the end of five days there was a decided rehardening of the enamel surface, and the white area of decalcification on the tooth mentioned had half disappeared. At the end of ten days the enamel could no longer be scratched with a lancet; at the end of two weeks the white spot of decalcification had almost, if not entirely disappeared, and both teeth appeared perfectly normal.

These tests seem to show that partially softened enamel may have the power of becoming hard again. This rehardening is difficult to explain, as the formulas of inorganic chemistry appear hopelessly ineffective in dealing with the complex enamel molecule, and concerning the enamel our present chemical knowledge goes no further than inorganic chemistry. The hardening may be a sort of recrystallization within the enamel substance; it may reunite with something taken from the saliva, or the enamel being largely composed of a carbonate, the CO_2 of the breath may have something to do with rehardening, just as the soft Bermuda limestone hardens when exposed to the air. I freely admit that I do not understand how it can happen, but I firmly believe that it does happen.

Might not this explain why the front teeth of some patients wear down to the gum line without a corresponding loss of diameter? The food acids might slightly soften enamel which, if given a

chance, would reharden. On the sides of the tooth it does reharden, but on the grinding surfaces the partially softened tooth enamel is worn away by mastication before the rehardening can occur. Of course, we all know that tooth-powders and grits are a great cause of erosion, but if the facts indicated by these tests are true, the partial softening of the enamel by food acids and the acids developed in the mouth may be considered as no insignificant factor in erosion.

THE CHEMICAL AND PHYSICAL CHARACTERISTICS OF PORCELAIN, AND THEIR RELATION TO ITS MANIPULATION.

By W. L. FICKES, D.D.S., Pittsburg, Pa.

(Read before the Dental Society of the State of New York, at its annual meeting, Albany, May 6, 1909.)

THE use of porcelain in dentistry affords opportunity for the production of beautiful and artistic work, and to those who understand its manipulation and persevere in its use it gives most gratifying results. Some natural aptitude, as well as a certain amount of training, however, is necessary for successful practice. There are some facts in regard to porcelain which, though of an elementary character, are not generally understood by porcelain workers. These facts relate to the distinguishing characteristics of porcelain, to the properties of the substances of which it is composed, and to the manipulation of the body.

DISTINGUISHING CHARACTERISTICS.

Most persons have a general idea of what is meant by the word porcelain, but there is no scientific definition which is beyond criticism. This is true because the name is applied, in a very unsystematic manner, to many substances which have very few qualities in common. Porcelain has been described as a semi-fused mass in which are suspended particles of unfused silica; also as a solidified mass composed of one or more silicious substances suspended in a fused silicate. There are many other definitions, none of which is satisfactory in every particular.

Several authorities assert that true hard porcelain is a more or less definite, though heterogeneous, compound. Church, Dillon, and others state that this can be seen by examining a thin section under the microscope by transmitted light, when innumerable minute slender rods will be seen, and between them many spherical granules, in a glassy base or matrix. These are called belonites and spherulites. They reflect the light and give to porcelain its characteristic translucency and lustrous fracture. This structure is developed by prolonged heat, at from 1300° to 1500° C., and the exposure of the body to this high temperature for a considerable length of time permits a complete rearrangement of the molecules. Porcelain is thus placed in a distinct class of fictile substances. By chemical analysis it has also been demonstrated that it should be so classified.

Porcelain is further distinguished from other fictile substances by several peculiar properties. The surface of true hard porcelain can be scratched by a crystal of quartz, but not by the hardest of steel. It may be compared with orthoclase feldspar, which is classified by the mineralogist as "6" on Mohr's scale of hardness.

Porcelain is quite dense, fuses at a high temperature, and resists all acids except hydrofluoric. It has considerable tensile strength as compared to other fictile substances, and although thin edges are quite fragile, it resists great stress when in bulk. Its fracture is conchoidal to splintery, and the edges show a white, uniform surface, a vitreous luster, and a granular texture. The latter is said to be due to the presence of the belonites and spherulites. It is translucent, but even in the thinnest splinters is never transparent. The paste, or body, is white, and when pure fires white, but a variety of colors may be developed, on firing, by the admixture of various oxids of metals. Vessels of porcelain, on being struck, give a bell-like tone, and in this respect differ from other kinds of pottery.

COMPOSITION.

True hard porcelain is made from quartz, kaolin, feldspar, and ball-clay. Quartz adds to the transluency, and at a moderately high temperature raises the fusing-point, but at its combining temperature the larger the proportion of silica to alumina the lower the fusing-point; kaolin whitens the product, increases its opacity and makes it more refractory in proportion to the content of alumina; feldspar gives it transluency and acts as a flux, and ball-clay increases the plasticity and binding power of the paste, or body. The result, on mixing and firing, however, is produced by the interdependent action of the several ingredients. Theoretically porcelain consists of chemically pure quartz, kaolinite, and orthoclase feldspar, but the methods of combining the various ingredients vary with the differences in the materials available to the manufacturer, the result depending upon the physical characteristics of the component parts, as well as upon their chemical analysis. The character of the body depends largely upon the mutual proportions of alumina and silica present.

In order to produce true hard porcelain certain materials are required, which, when combined, will give a definite chemical result; and if the requisite amount of an element is not present in one ingredient, it must be supplied in another. The materials used are not uniform in composition, hence the many methods of compounding. When they are of the most perfect chemical composition, the porcelain has a more or less definite, though complex, molecular structure, but this is easily changed to an adulterated form by the admixture of foreign materials, or by an excess of one or more of the ingredients. Such adulteration has a tendency to deteriorate the final product, and to detract from some of its most essential qualities. The material, however, must necessarily be modified for dental requirements.

The ingredients are given considerable preliminary treatment in order to attain an even standard of excellence. By means of heating, grinding, washing, sifting, and mixing, they are reduced to the uniform condition which is essential to the production of high-class work.

BINDING POWER AND PLASTICITY.

The binding power of clay and porcelain body is due to the presence of a proportion of highly hydrated, amorphous particles, which are coherent through the action of their water of combination. These are called colloid particles, and lose their colloidal action on firing. When an increase of binding power and plasticity is desired, the clay or body may be worked to the consistence of a pasty slip and allowed to remain in that condition for a considerable time, thus increasing the colloidal action. This is called tempering or ripening the clay, and is due to the gradual softening of the particles under the influence of water. Mixing clay or body with a two per cent. solution of tannic acid and allowing it to stand for some time will greatly increase its binding power and plasticity, and will diminish its air-shrinkage. Starch, tragacanth, and other colloidal substances have been used to increase the binding power of dental porcelains when their natural coherent properties were deficient.

FUSIBILITY.

Purely crystalline substances have a definite melting-point, but non-crystalline, amorphous substances soften gradually until they flow. Porcelain body is compounded from a mixture of crystalline and amorphous substances, and has no definite melting-point. Dental porcelain is properly fired when the maximum strength has been developed. In order to attain the maximum strength it is necessary to heat it for a considerable time. True hard porcelain requires from forty to forty-eight hours for the firing in order to develop its strength and translucency, and from two to three days cooling to properly anneal it and to permit of safe handling of the ware. Dental porcelain, which contains more flux, does not require so long a time to complete the required chemical changes, but it is much improved in strength and appearance when it is fired for a longer time, at a lower heat, than is usually the case.

The fusibility of porcelain body depends upon the chemical arrangement of the elements present, the chemical and physical properties of its constituent compounds, the degree of fineness of its particles and their compactness, the number of times it has been fired and reground, and the nature of the heat and the manner of its application. It can be made less fusible by additions of its more refractory constituents, and the fusibility is increased by adding a flux. Sodium and potassium are used for the latter purpose, in dental porcelain, in various formulæ, usually in the form of a high-grade flint glass. The increase of fusibility is accomplished by the combination of the acid oxid of silicon and the alkaline or basic oxids. The fusibility is dependent principally upon the percentage of these basic oxids present.

CONTRACTION.

A clay or a porcelain body contracts during drying on account of the loss of water, and on firing because of the loss of water, organic matter, etc., and by reason of the fusing together of the particles and the chemical reactions of the ingredients. The amount of contraction may be expressed as either linear or cubical contraction. The linear contraction may be found by measuring the distance between two known points before and after firing. For this purpose make a disk 10 mm. or more in diameter and one-fifth as thick, measure the diameter after firing, and express the contraction in percentage. It is important to know the contraction of a body in order to work it successfully.

An irregular piece of porcelain body will contract toward the center of bulk, and the parts most distant from that center will show the greatest linear contraction toward that point. If the most distant part consists of an acute angle, there will be considerable difference between the contraction at that angle and of the surface nearest the center of bulk. This difference will be greater as the fusibility of the body is increased. This tendency to spheroid is less if the fusion to specific hardness is accomplished at a low heat and a long firing than it would be by sharp firing.

Contraction is influenced by the adhesion of the body to a fixed point, such as the metal framework of a crown or bridge, and will be greatest toward the point of adhesion, instead of toward the center of bulk. When the metal part is frail, the body shrinks toward the center of bulk, and the metal is distorted. Contraction, in an inlay, may be controlled by coating the matrix with a thin shellac varnish. It may be controlled in all classes of work by settling the particles of body more closely together, by the use of cores or pieces of ready-fused porcelain, by a division of the body to allow shrinkage toward several centers instead of to one common center, by slow firing at a low heat instead of quick firing at a high heat, and in other ways.

COEFFICIENT OF EXPANSION

The coefficient of expansion of porcelain bodies of different composition is variable. When two such bodies are fused together, tension is developed at

the surface of contact. If the materials were elastic the weaker one would bend, but as porcelain possesses limited elasticity, the tension on cooling will cause cracking in one or the other of the layers, or possibly in both. This is known as crazing and shivering. When the stronger layer contracts less than the weaker one, the latter is crazed, and when it contracts more, the weaker layer is shivered. When they are of nearly equal strength and differ in their coefficient of expansion, they each develop cracks or are shivered.

The cracking may occur at any time after cooling has taken place. The less the difference in the coefficient of expansion of the two layers the less the tension, and probably the longer the time before cracking develops. In baking one body on to another care should be taken to select bodies having approximately the same coefficient of expansion. This could be determined with precision by measurement, but probably a more convenient way would be by the empirical method of baking samples of the various bodies together in layers of varying thickness, and noting the results. Additions of kaolin or of feldspar to the body decrease its coefficient of expansion, while quartz added will increase it, the amount of increase depending upon the fineness of the grain.

POROSITY.

If dental porcelain is not fired properly, porosity may occur. This is caused by the evolution of gases, usually sulfur dioxid and water, which are developed after the porcelain has become fluid and viscous. Sulfuric acid is usually present in porcelain glazes and in dental porcelains, either accidentally or by intention. It occurs as an impurity in many materials which are used in the manufacture of porcelain, and is very difficult to eliminate. It may be present in the form of salts, such as the sulfates of calcium, barium, or magnesium, and may undergo a double decomposition with the alkaline salts in the high heat of the furnace. Other compounds which give off gases are usually decomposed and the gases expelled before the particles of the body are fused together, but the sulfuric acid is only decomposed and expelled, in the form of sulfur dioxid and water, under reducing influences or at a very high temperature. It may decompose and give off gases when the porcelain is in a fluid state and form innumerable small bubbles, or it may remain undissolved until the porcelain has reached a high density, in which case pockets or large bubbles may occur. The potter overcomes this difficulty by reduction, but as the conditions in the dental furnace are of an oxidizing nature, other expedients must be resorted to by the dentist. In order to allow the various gases to escape before the point of viscosity is reached, and to prevent the decomposition of substances which evolve gases only at high temperatures, thus avoiding the formation of bubbles, the porcelain should be fired at a low heat for a long time. Quick firing and excessively high temperatures are the principal causes of bubbles, and the porosity thus caused is accompanied by a loss of color and a considerable loss of strength in the porcelain.

ANNEALING.

Dental porcelain in some respects is similar to glass. On cooling, the outer parts contract on the central portion, thus creating tension. This would be corrected by the gradual adjustment of the molecules, but cracks sometimes occur before this is completed. It should be annealed in order to lessen the tension between the outer and inner portions of the body, and between the body and the metal framework. This may be accomplished by slow and careful cooling. Large pieces of work, such as continuous-gum dentures and bridges, may be further annealed by placing them in water, after they are sufficiently cooled, and boiling them for some time. This is the method used by housekeepers for annealing jelly glasses, and in some localities glass lamp-chimneys.

PYROMETRY.

Various methods have been used for determining the changes of temperature in furnaces; perhaps the most convenient is the pyrometer which consists of a thermocouple, with a milammeter for calibration. The melting down of pyroscopes of progressive variations in chemical composition has been used to advantage. Princep's alloys are used by some operators, but they are not so reliable as Seger's cones. The metals and alloys have definite melting-points, while porcelain body has not, so that the metal may be melted by a quick rise in temperature and the body not be fused; or the body may be fused by slow firing and the metal not melted at all. The use of pyrometric cones made of body similar to that which is to be fired is probably the best method of determining the influence of the heat. These cones do not indicate exact temperatures, but the firing affects the cones and body in a similar manner. Cones may be made of varying composition, to suit the various requirements. Seger's cones can be bought at the supply houses, and similar cones are sold at dental depots.

It would seem, from the facts stated, that porcelain may be manipulated so as to meet every requirement, but that if adulterated in an excessive manner it loses many qualities necessary for dental work. There is no doubt that a large percentage of failures in the work have been caused by improper firing. Many operators have failed in their attempts to do the work owing to a lack of knowledge in regard to contraction, and to inability to control such conditions as would naturally arise from shrinkage. An understanding of the coefficient of expansion of the bodies would enable the operator to avoid failures which might not be detected until a time subsequent to the completion of the operation and the dismissal of the patient. Probably many men who have given up porcelain work might have succeeded had they understood the material and the proper methods of manipulating it. There are many other points which are of importance, but the time alloted to the subject will not permit the mention of them. The writer has endeavored to cover, in a brief manner, only a few of the most important phases of the subject.

PYORRHEA ALVEOLARIS FROM A BACTERIAL STANDPOINT.

By TIMOTHY LEARY, M.D., Boston, Mass.,

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(Read before the Dental Society of the State of New York, at its annual meeting, Albany, May 6, 1909.)

AT the meeting of the National Dental Association held in Boston in 1908, I reported the results of some studies on pyorrhea from a bacterial standpoint. With the large clinical opportunities available, it is our intention to continue the study of this disease over a period of years, and the first communications, together with the present paper, are offered only as reports of progress.

Pyorrhea, together with tuberculosis and dental caries, is a universal disease. It appears in the human race in all climes and under all social conditions, in the poor cereal-eating natives of India as well as in the well-to-do beef-eaters of our own country. It is not a modern

disease, since Goadby has described evidences of it in early Egyptian skulls. Like tuberculosis, it is a disease of domestication and condensed populations. In peoples living a free life in the open, as for example, the beef-eating Gauchos of South America, pyorrhea is practically unknown. These same people, when they herd in cities, early exhibit the disease. Outside of human beings pyorrhea is found in most of the domestic animals. Collyer has called attention to its frequency in London cab-horses. Bland-Sutton and others have shown that it is common in monkeys in captivity. Talbot has reported that 80 per cent. of dogs over eight years of age have the disease. It is undoubtedly present in a considerable percentage of the older wild animals in captivity.

A study of the etiology of pyorrhea has led practically all writers who have considered the subject to the conclusion that both general and local causes play an important part in its evolution.

The general causes are such as are associated with a lowering of the resistance of the individual. Insufficient food with a monotonous diet is asserted by Badcock to be the important factor in the causation of the disease in natives of India. Correlative with this is a generally lowered vitality marked by increased susceptibility to infectious processes as a whole. An associated influence in the tropics is exerted by exposure to tropical sun, since well-fed white men are prone to develop pyorrhea after a short stay in the tropics, as has been shown by examinations of American troops returning from Cuba and the Philippines.

Intestinal auto-intoxication has been recognized as a predisposing cause for many years. Recent studies have indicated how the excessive proteid diet of the meat-eater may give rise to such intoxication. The work of Metchnikoff and his pupils has resulted in a demonstration that the normal bacterial flora of the large intestine may be replaced by putrefactive bacteria, which find an ideal environment in the anaerobic conditions obtaining in the contents of the large intestine, and an ideal food in the proteid residue which is not absorbed. Specific evidences of the activity of the bacteria in the causation of this disease have been produced in only one condition, pernicious anemia, in which Herter has demonstrated an apparent relation of the actively hemolytic gas-bacillus to the blood destruction which is the prominent element in this disease. Negative proof has accumulated from the demonstration given by Metchnikoff and others that the elimination of the putrefactive organisms from the intestine through replacement by milk bacteria is followed by the clinical disappearance of the nervous symptoms associated with so-called auto-intoxication, also by marked diminution of indican and related bodies in the urine.

That various notably metallic forms of poisoning may be followed by pyorrhea has been repeatedly observed, and has been studied experimentally by Talbot.

The influence of specific diseases on the causation of this process is an undoubted one; cases of pyorrhea associated with diabetes, malaria, typhoid, rickets, syphilis, tuberculosis, anemia, and other conditions have been reported.

We have therefore many general predisposing causes, most of which act by lowering the resistance of the individual to infection to such a degree that his weakest point is attacked. I do not agree with the conception that pyorrhea is a local manifestation of any specific disease in the sense that the specific agent is directly the exciting cause of the process in the jaws. The claim that pyorrhea is always due to syphilis, for example, is absurd on its face. That pyorrhea frequently appears in syphilitic individuals we all admit.

From this standpoint, then, several agencies may have a general predisposing influence on the causation of this disease, *i.e.* domestication, nutritional disorders, intestinal putrefaction, poisons, and specific diseases.

The local conditions which may predispose are also many. Talbot has repeatedly called attention to the fact that the teeth and jaws are degenerating structures which are destined to undergo pro-

gressive decline as civilization advances. The teeth are normally deciduous tissues whose tenure of life in the jaws is at best feeble. Nowhere else in the body is there found so unsatisfactory a mechanical arrangement as that which causes the hardest tissues of the body, the teeth, to project from soft parts on to a free surface. The junction of tooth and gum is guarded principally by a circular layer of white fibrous tissue, relatively inelastic and poorly supplied with bloodvessels. This junction is bathed with a fluid which is rich in bacteria. Into the mouth are introduced food substances contaminated with bacteria, and mastication is necessarily associated with the deposit of these bacteria at the gum margins. The marginal attachment may be such that natural pockets exist which favor the lodgment of micro-organisms, or, if natural pockets are wanting, many agencies may by traumatic means give rise to the production of such pockets. If a pocket is once established, conditions are satisfactory for bacterial invasion. It is a recognized truth in bacteriology that many bacteria which by themselves are incapable of giving rise to infection, may do so if introduced into the tissues with a foreign body. Such an association is well illustrated by the custom of the people of Madras and neighboring districts of India, who scrub the teeth with charcoal in such a way that this material is packed down beneath the gum margin, and no effort is made to clear it away. As a result pyorrhea is almost universal in the races who carry out this procedure. Even in the individual who is moderately careful with his teeth, the accumulation of food material in this region is usual, and the undissolved food particles, which are constantly replaced, are capable of acting as foreign irritant bodies.

Other factors favoring local predisposition are improper use of toothpicks and tooth-brushes, cap crowns, wedging, badly made bridges, ill-fitting dentures, regulating apparatus, and possibly the deposit or action of gross crystalline masses in tooth-powders.

The local process once established, a new factor appears, which adds to the foreign body irritation, in the form of serumal calculi. All the elements necessary for the deposit of such calculi are present; an organic matrix bathed in fluids rich in salts, and situated in a region where CO_2 is being constantly produced. A further element of recognized surgical importance is found in the difficulty of efficiently draining such pockets when once formed.

The repair of the pocket proceeds slowly under the untoward conditions present. Not only is the peridental membrane with its circular ligament relatively avascular, but with the assistance of the gum tissues it must develop growth against tremendous odds in order to fill the cavity. It must also re-establish a firm connection with the tooth, which is an even harder task. If the process is therefore once well established, the result is that the slow healing ends in a chronic effort at granulation, which in most cases becomes as futile as the attempts to repair a well-established leg ulcer. If during this time the tooth has become loosened, a new complication is added.

It is believed by many writers that the bacteria present in pyorrheal pockets are important elements in the actual production of the process. The various predisposing causes, both general and local, which have been mentioned all tend to favor the multiplication and invasion of the bacteria. That the bacteria, if they be not the active elements in the initiation of the process, are of importance in the continuation of the condition will be agreed by all.

Pyorrhea of two distinct types, as measured by the exudate, is met with. In one type there is little or no discharge, and much effort is needed to force even a small amount of serous or purulent material from the pockets. In the second type pus, thick and creamy, wells from the pockets on slight pressure or may present at the junction without pressure.

Studies of pyorrheal discharges in man have furnished the most varying results. Miller, Black, Kirk, Cook, and Matzuschida have described a variety of organ-

isms obtained from pyorrheal processes. The most recent systematic research has been conducted by Goadby, whose work, however, was carried out wholly with aerobic cultivations. He found in pyorrheal pus a great variety of organisms, as was to be expected. His primary cultivations were made wholly upon agar, which is not an ideal culture medium for many of the bacteria of the mouth. Remarkable in his series is the absence of pneumococci from all of his cultures, a fact which can only be accounted for by the agar used, since this is a medium on which the pneumococcus does not grow well. He concluded from his observations that pyorrhea was related to ulcerative stomatitis in children, and that both conditions were due to lactic acid organisms, which were introduced with milk. He was undoubtedly influenced in his findings by the demonstration of the important part which organisms capable of producing lactic acid play in the etiology of caries. He believes, apparently, that general disease conditions, such as anemia, which follow pyorrhea are also due to these organisms. This is a distinct contradiction of the work of Metchnikoff and his school. The medical world is using lactic acid organisms in the form of buttermilk in the treatment of these very conditions, and with a success which negatives absolutely any claims that such organisms are capable of producing general diseases.

Arkövy, Simms, and Carmalt Jones and Humphreys have described the short-chained streptococcus of the mouth as the important organism in producing pyorrhea.

In our own experience, which includes the study of about 100 cases of pyorrhea, cultures have furnished a great variety of organisms. The medium used was milk serum, on which all of the important pathogenic mouth bacteria grow well. Perhaps the most constant finding has been the pneumococcus. The streptococcus, in both short and long chains, has appeared frequently, and the staphylococcus, rarely alone, but usually in association with either the pneumococcus or streptococcus, has been often found. In many cultures unsatisfactory or badly mixed growths have been obtained.

In anaerobic cultures upon blood agar or milk serum a considerable variety of bacillary forms which did not grow well in aerobic cultures have appeared.

The picture in smears has differed distinctly from cultural findings. Constantly have we found present the fusiform bacillus, a spirochætal organism, which was first described by Vincent. This organism, known today as the fusiform bacillus, is extremely difficult to cultivate. It is an absolute anaerobe and requires special media, ascitic or blood agar being most satisfactory. It is a normal inhabitant of the mouth. It occurs in many lesions about the mouth in the form of fusiform rods with a granular staining, from the ends of which delicate filaments which take a spiral form and which become free as separate spirilla or spirochætæ are formed. It is found in Vincent's angina, mercurial and ulcerative stomatitis, gangrenous stomatitis, noma, and hospital gangrene. It has been described as the cause of foul abscesses about the mouth. It is usually found in association with other organisms, notably the streptococcus and the diphtheria bacillus. The controversy on the etiology of noma throws an interesting side-light on the bacteriological dispute as to the important etiological factor in pyorrhea. For some years it was insisted by some that various bacilli, including the diphtheria bacillus, and by others that the streptococcus was the active cause of noma. All of these organisms were readily cultivated on ordinary media under the ordinary aerobic conditions. The true etiological factor was laid bare only when sections of the lesions showed the process to be due to the invasions of the tissues by a felt-like interwoven mass of fusiform bacilli and spirilla. Cultures properly made upon satisfactory media from which oxygen was excluded brought out the fusiform bacillus as the real offending agent.

This organism is, then, under ordinary circumstances a harmless inhabitant of the mouth, as is the pneumococcus. It has been found in 100 per cent. of smears

made by removing with a toothpick the material adherent to the gum margin in dental students who are careful of their teeth. It is incapable of infecting, while the resistance of the individual is normal. But if his general resistance be greatly lowered, or if it be slightly lowered and local injury provoke a *locus minoris resistentiæ* at the gum margin, infection will follow. The processes initiated by this bacterium are not characterized by a marked inflammatory reaction unless there be an associated infection with pus-producers. Alone, the organism tends to cause a slowly spreading necrosis with solution of tissues, and a minimal amount of exudate is produced. Add the pus-producers, and abundant pus will follow. It is prone to establish itself in processes begun by other organisms, and this is notably true of syphilitic lesions. Its constant association with the lesions of mercurial stomatitis has been mentioned. If the resistance of the individual is not too greatly lowered, the processes to which it gives rise are slow and chronic, not usually associated with a rise in temperature or other constitutional symptoms. On the other hand, in the child who has passed through a series of infections such as the exanthemata, measles, scarlet fever, and chicken-pox, with perhaps a final attack of diphtheria, a spreading gangrene with a high mortality is the almost constant result.

We have therefore concluded, for present purposes, from the constancy of the fusiform bacilli in the lesions of pyorrhea and from the predominating numbers of the organisms even in very mixed infections, that this bacterium is to be looked upon as an essential infecting agent in most cases of pyorrhea. We have recognized that its association with the pus-producers is responsible and perhaps necessary for the production of florid types of the disease accompanied by an abundant flow of pus.

The treatment which we have practiced has been based upon the above considerations.

The rational surgical treatment of pyorrhea calls for—

(1) The removal of local irritation. The most important factor here is the removal of foreign bodies. Instrumentation to clean the tooth surfaces of calculi is an essential. If teeth are loosened, it is requisite that these be firmly fixed and supported.

(2) The application of some agent which will inhibit bacterial activity. Vincent found iodin an almost specific agent in the treatment of angina due to the fusiform bacillus. We use therefore Gram's solution (I 1, KI 2, Aq. 100) in local application to the pockets. This solution is less irritant than the tincture which is usually applied to the tonsillar lesions. Iodin has also valuable stimulant properties and will awaken indolent granulations to activity.

Where there is much pus, the application of vaccines is of valuable assistance in overcoming the secondary infection with the pus-producers. Goadby in his work found indices low to the staphylococcus—he obtained no cultures of the pneumococcus—and he therefore used staphylococcus vaccine with success. Carmalt Jones and Humphreys found a short-chain streptococcus and made use of a strain of this as a vaccine in several cases, with fair results. As I have said, we found the pneumococcus most frequently, with the streptococcus in many cases and the staphylococcus as an associate of either or both of the above. An autogenous vaccine from the patient's lesions, or a stock many-strain pneumococcus to which are added a stock staphylococcus, has been used in our pus cases.

The results are distinctly encouraging. In mild cases where pus was not abundant, frequent instrumentation together with daily thorough applications of IKI solution have repeatedly given us perfect results. Where the saliva has been markedly acid, sodium bicarbonate has been used as a tooth-powder, as suggested by Dr. A. W. Doubleday.

In pus processes frequent instrumentation with IKI and vaccine treatment have given almost equally good results. Where teeth were markedly loosened their perfect re-establishment in their

original firm position has been slow, and some teeth have been sacrificed.

A small remainder of cases have improved slowly under treatment, but complete success has not been obtained.

In concluding I can do no better than quote the concluding paragraph of my paper of last year:

"Whether our results will have any permanence or not is a question which time alone can answer. The healing of retracted gums and the obliteration of pockets leaves a joint between gum and tooth less perfect even than it was originally. That such joints will later remain free forever from infection is almost too much to expect. It is therefore improbable that we have established in any of our cases a permanent cure for pyorrhea. We have made more simple, we believe, its management, and ask further application of the methods by the dental profession."

THE RELATIVE MERITS OF THE CAST AND THE MALLETED GOLD FILLING.

By DANIEL H. SQUIRE, D.D.S., Buffalo, N. Y.

(Read before the Dental Society of the State of New York, at its annual meeting, Albany, May 6, 1909.)

THE history of dentistry shows that the introduction of a new material or of a new process of applying an old one has usually induced dentists to take sides either as advocates or opponents of such innovations.

These conditions are manifest in the development of all branches of science. It is the better way in which to settle such problems and to eventually arrive at definite results.

Very little, however, can be done unless we lay aside all personal feeling, and base our conclusions upon what men have already accomplished along these lines.

It is well to be conservative, and equally so to be enthusiastic in one's work, but first of all we should be guided in our practices by intelligent and thoughtful study. We cannot judiciously oppose the modern ideas because they do not appeal to us, and condemn them on general principles as being unfit. Is it not right to at least investigate the merit of the new methods as they are introduced, and to thus add our mite toward properly placing them? This is a common duty which every one of us owes to our honored profession. We cannot all be a Wells, a Miller, or a Black, but we each can do something which will elevate or broaden dental science.

In this experimental work, which supplements the practical, we must be honorable enough to declare, if need be, that the deficiency lies in us rather than in the method or the material. Many times we meet with failure owing to a lack of proficiency either in the technique of the operation itself or in the manipulation of the material to be used.

Prejudice and petty jealousy have shut the door of dental progress so tightly that the rays of intellectual advancement have not shone into the lives of some practitioners until long after the worth of the new processes has been recognized and accepted by the profession generally. In proportion to this antipathy, the dentist suffers from the loss of the benefits to be obtained by these improved methods of

practice, and through this same narrowness his patients are likewise made to suffer.

Can we therefore discard these later methods and materials as worthless before a sufficient period has elapsed to test and establish their usefulness? And, if adequate opportunity has not been given for these trials, have the opponents had the requisite amount of time in which to condemn them? or do negative facts mature earlier than affirmative ones?

The enthusiast is liable to hinder the proper placing of innovations because he does not fully acquaint himself with the physical characteristics of the materials, neither does he show any apparent discrimination in their application. In other words, his enthusiasm overbalances his judgment.

We have no single remedy with which to cure everything. The materials for filling teeth are many. Dentistry has developed so rapidly, and the standard of dental education is today so well grounded upon sound fundamental principles, that we are more responsible now than ever before for the choice of the materials and methods which we employ in practice. Higher education in dentistry enables one to select the better things, and in the work of everyday practice the progressive dentist is constantly changing the old for the new.

Someone has said that "Life is active correspondence with environment." Each of us lives in a sphere according to his ability to choose the higher and better things as they are presented to him. Are we therefore content to live in the lowest environment of a dental practitioner—the extractor and the plate-maker—or in a little higher one—that of the dentist of only plastic ability? or are we selecting the best things in order that we may give our patients the highest and the most scientific service?

We should encourage the development of the new processes and new dental materials, and the man who, from his unselfishness, gives to his fellow practitioners new methods as they come to him should have all the praise, even though they had been previously known and practiced by others for years. It is the man who gives freely and without reward who merits the respect and commendation of all.

We have heard eminent men pray for a pathologic sense, and it seems to the writer that the time is at hand to pray for an operative sense as well—a sense which would enable one to diagnose the operative procedure in each case, to properly prepare cavities, to employ methods and materials which are best suited, without allowing the thought of remuneration to turn him from his duty. These senses go hand-in-hand in the practice of dentistry. Of what use is the pathologic without the operative sense? It does not matter how capable a man may be in diagnosing diseases if he cannot prescribe the proper remedy or the correct operative procedure, or has not mastered the technique of removing or changing the faulty conditions. The wholesale abuse of new methods and materials not only detracts from their usefulness for a time, but is a great hindrance to establishing a proper place for them. We cannot expect good results from misapplied knowledge or an utter lack of the appreciation of existing conditions. There are pathologic, physical, artistic, and humane reasons which should be considered in choosing the materials to be used and the consequent method of procedure. Failure to recognize these will do as much in the future to create disfavor with either the cast or the malleted gold filling as it has done in the past.

If a builder is about to erect a pillar of masonry to sustain a great weight, he must know approximately the number of tons which it must support. He then plans the seating of this column with great care. Are we surprised that he digs down to solid rock for the foundation, that he makes this foundation level or flat, or that he is particular to secure good adaptation of the materials to this foundation seat? The pier is also erected by a systematic formative process; each piece of material has its place; it is not thrown in here and there, but laid accurately. The sum total of all this ex-

actness tends to insure strength. We can, if we will, apply these principles to cavity preparation for either the malleted or the cast gold filling. Success will depend upon a firm foundation in solid dentin, a flat and broad seat; and the gold, whether malleted or cast, must be placed with care. The adaptation of the material to the cavity walls should be perfect, in order to withstand the stress of mastication and to exclude moisture with resultant ingress of micro-organisms of decay.

It is the opinion of the writer that many of the failures of the cast gold filling are still due to faulty preparation of the cavity; therefore he ventures to suggest the following points to insure the proper seating of the filling:

For convenience of description we will take up the resistance form of the cavity first. In approximo-occlusal cavities in bicuspids and molars, this form would apply to the gingival and also the occlusal floors of the cavity. The extension of the buccal and lingual walls to self-cleansing areas will give the gingival seat the proper length; its breadth will be governed by the amount of stress to which the filling will be subjected. These side walls should be perpendicular to the gingival seat, and at their junction the angles should be sharp. The axial wall is also cut perpendicular to the seat, meeting the buccal and lingual and gingival walls at an angle.

The retention form is applied in the occlusal portion of the cavity. Upon this surface the floor of the step, which also is a part of the resistance form, is made as flat and broad as possible without weakening the crown of the tooth. The buccal, lingual, and mesial or distal walls (as the case may be) should be cut so that they will meet the pulpal wall at an angle of about 112°. If increased retention is deemed necessary, a groove may be cut across the mesial or distal end of the step, and sunk to sufficient depth to prevent any possibility of the filling being forced out of the cavity by the stress of mastication. The gingival and occlusal seats may also be inclined pulpally, the former toward its junction with the axial wall, and the latter as it approaches the end of the step. The cavo-surface angle should describe a graceful curve throughout its extent, and should be beveled slightly occlusally for the protection of the enamel rods, and gingivally to remove the shortened rods along that margin.

This preparation gives a practical resistance and retentive form, and with the definite angles of the inside formation the filling is still more securely seated. The same cavity formation is used for the malleted gold filling with but two changes, namely, the cutting of the convenience form at the gingivo-bucco- and gingivo-linguo-axial angles, and the shaping of the side walls of the step perpendicular to the pulpal wall. Greater resistance may be obtained by an angular cavity preparation than by one of rounded formation.

The stress of mastication should be considered before the formation of the cavity is effected. Upon examination, if the corners of the teeth are broken, their surfaces worn down by mechanical abrasion, and the fillings burnished brightly, it is evident that the stress brought to bear upon these teeth is much greater than it is in the mouths where such signs are absent. While this force depends upon the toughness of the pericementa of the remaining teeth, yet we know from tests which have been made that it ranges from 100 to 275 or even 300 pounds. If this pressure is brought to bear upon the corner of a filling, it will force it from the cavity unless it is securely seated. This same force, if acting continually month after month, will eventually unseat a poorly anchored filling, even though this does not receive more than its share of the impact.

Adaptability has a very important place in the attributes of any filling material. There are two methods employed for the casting of gold fillings. In one a modeling compound impression is taken of the cavity, from which an amalgam die is made. This enables the operator to produce any number of fillings from the die, and in case of faulty manipulation or other mishap, he can make a new filling

without requiring the presence of the patient.

The other method is the adaptation of the impression wax directly to the cavity for the production of the model. If failure occurs the presence of the patient is necessary in order to obtain another wax model. The cast filling, therefore, depends for its adaptation upon the sharpness of the impression or the adaptation of the wax model directly to the cavity, and the writer is convinced that cast gold cannot be so closely adapted to the walls of the cavity as the malleted gold.

If the former method is adopted, the best material for the taking of the impression is Detroit compound. The tray is made from 26-gage platinoid plate and is so shaped that it will cover the surfaces to be taken. The compound is placed in the tray and warmed by dry heat. When thoroughly softened it is forced into the cavity. The shape of the impression tray will assist materially in driving the compound into all parts of the cavity, and the excess will be forced out at right angles from the cavity margin. This insures a close adaptation of the material to the cavo-surface angle, as well as to the interior of the cavity. The impression is cooled and removed from the cavity. Four walls are then built about it with plaster of Paris, to enable the operator to force amalgam into all the little inequalities of the impression. The amalgam for this purpose should be mixed of equal parts by weight of alloy and mercury, and used soft. If it is too dry, the amalgam die will not be sharp but ragged, and unfit for use. Cheap alloys and those containing less than 60 per cent. of silver to 40 per cent. of tin should not be used for this purpose, as they contract and are unreliable. Amalgams containing over 80 per cent. silver to 20 per cent. of tin expand in setting. As the primary contraction takes place during the first twenty-four hours and is greatest two hours after the crystallization, it would certainly have some influence upon the fit of the inlay. By Dr. Black's exhaustive experiments it was found that an amalgam made of an alloy containing 65 per cent. of silver and 35 per cent. of tin showed the least amount of contraction. After the amalgam has crystallized, a wax model is taken from the metal die, and after the bite has been previously taken, the approximal and occlusal portions may be carved to proper form with suitable instruments, always cutting the wax toward the margins. The wax is then cooled, removed from the cavity, and placed upon the sprue.

If the wax model is made in the mouth, the same principles apply to this procedure as in the former process. The wax is thoroughly warmed and quickly forced to place, and the patient instructed to perform the movements of mastication; this will shape the occlusal surface, and when it is properly carved, the model is cooled and removed from the mouth.

The surface of the wax model which is in contact with the cavity should have a smooth appearance, all the lines being sharp and well defined. If the angles of the wax model are rounded, or the surface has a scaly appearance, the model has not been well adapted to the cavity. Many operators are led to believe that it is impossible to cast gold into angular cavities, owing to their failure to properly manipulate the wax.

When the wax is cooled to allow its withdrawal from the cavity, it contracts; if it is immediately invested in its cooled state it will interfere with perfect adaptation. It would seem that if the wax were put in a water-bath of about 90° for a few moments, and then invested in an equally warm investment, better results could be obtained.

Of the investment materials upon the market, Taggart's and Peck's are most universally used. A good material may be made of three parts by weight of finely powdered silex to one part of plaster of Paris containing enough Dixon's powdered graphite to color it slightly. Among the brands of wax for impressions, a preference seems to be given to that of Dr. Taggart.

Defects in cast fillings occur in the majority of instances at the approximal portion of the cavity. In view of this fact, the writer has had four cast fillings

made from an angular-formed cavity in the approximo-occlusal surfaces of the same molar. Here [exhibiting] is an inlay of pure gold cast by the Taggart method at thirteen pounds' pressure; also one of pure gold cast by the centrifugal machine; one of pure gold cast by the vacuum process, and one of pure gold cast by the impression method in the Taggart machine.

Here [exhibiting] is an adaptation of a cast gold filling in an approximo-occlusal cavity of a bicuspid. It demonstrates the necessity for care in placing the sprue in position. The wax was drawn away from the walls by overheating the sprue, and the gold is defective at that point. The next two views illustrate cast gold inlays in approximo-occlusal surfaces of molars. One represents an inlay cast by the direct method; the other, one cast by the impression and amalgam mold method. Two of the next three illustrations show the adaptation of pure cast gold of 22 karat; the third, the adaptation of 2 per cent. platinous gold to a rounded cavity preparation in a porcelain molar. The next two illustrations show the adaptation of foil at the margin in the approximo-occlusal cavity of a bicuspid. The gold was condensed by 5 pounds' hand pressure throughout.

The use of the artificial stone invented by Dr. Price of Cleveland, Ohio, has been indorsed by many eminent dentists as superior to the impression methods, but the writer has not had sufficient time to test its merits.

CONDENSATION.

Condensation is another important factor to be considered. Gold foil may be accurately adapted to the cavity walls with hand pressure and further condensed by mallet force. The gold must be strong in itself. It must resist a given crushing stress in either the cast or the malleted form. Pure gold in the malleted form withstands a higher crushing stress than does that in the cast form. The reason for that is that pure cast gold is soft, while in the malleted filling its molecular tension is raised by hammering, and it is hardened.

In order to show a comparative test in the crushing stress of the cast and the malleted gold, it became necessary to devise an instrument which could be set by the scales to produce a given degree of pressure at each thrust.

The instrument resembles in appearance an ordinary automatic mallet, in which a very strong thrust spring is put upon the socket piece behind the hammer. This spring operates to thrust the socket piece, and when the instrument is pressed upon the filling, the socket piece recedes the same as in an automatic mallet. The thrust spring is compressed as the socket piece recedes, and is strong enough to transmit any force required up to 15 pounds. A light hammer is retained in the instrument, with a light actuating spring. When the instrument is in use the hammer will strike, and a sharp click is heard by the operator when the socket piece has receded to a certain point. This sound denotes the application of the amount of pressure for which the instrument has been set. The blow delivered by the hammer is so slight that its force is insignificant.

If, therefore, we condense a given quantity of gold with a plugger whose face is of known dimensions, stepping the plugger across the surface an equal number of times for each piece of foil, at so many pounds' pressure per thrust, we can arrive at some conclusion as to the force necessary for the condensation of a certain amount of foil.

For these tests a steel cavity die was made three-sixteenths of an inch square, and fillings were inserted, using 3 lb., 5 lb., and 7 lb. pressure by hand, each piece receiving twenty-five impacts, using cohesive gold throughout.

The cavity was also filled with noncohesive gold at the bottom and with cohesive gold at the upper three-fourths of the cavity, with the ordinary automatic mallet force. Next, the hand mallet was substituted for the automatic mallet under the same conditions for another trial. Following this, wax models

were taken of this cavity die, and pure gold of 22 karat, 5 per cent. platinous gold, was cast into cubes under 13 lb. pressure in the Taggart machine.

From these tests the following conclusions were reached:

(*a*) That pure cast gold yields to a given amount of stress more easily and to a greater degree than malleted gold, except when non-cohesive foil is used in the bottom of the cavity.

(*b*) That 22-karat gold is intermediate in resistance between pure cast gold and 5 per cent. platinum and gold.

(*c*) That 5 per cent. platinum and gold (cast) yields less than either of the other kinds, or the malleted gold.

(*d*) That cohesive foil condensed with 3 lb. hand pressure is not sufficiently hard to withstand the stress of mastication.

(*e*) That cohesive foil condensed with 5 lb. hand pressure is practically as strong as pure cast gold.

(*f*) That cohesive foil condensed with 7 lb. hand pressure is nearly as strong as hand-malleted foil, and is stronger than either 24-karat or 22-karat cast gold.

One principal objection urged against gold fillings is the dreaded and so-called barbaric application of the malleted gold filling. If we allow foil to be exposed to the fumes of aqua ammonia in the gold drawer, it is rendered very soft and non-cohesive. The property of softness is retained even after the gold has been annealed. This is an important quality, as the foil is more easily adapted.

In the use of foil we can arrive at definite results. The sheets are cut in sizes ranging from one-sixty-fourth to one-eighth of a sheet, and made into pellets. A definite number of blows are delivered upon each pellet, according to its size, to give a sufficient degree of hardness to insure proper condensation. The strain imposed upon both operator and patient may be considerably lessened by placing a sheet of No. 4 soft foil at the gingival portion of the cavity. This is placed in the form of solidly rolled cylinders, and it shortens the malleting process of the operation by one-half. Annealing gold in the flame, carrying it by means of pliers, plugger points, or explorers, all interfere with the working qualities of the material.

The operation may be facilitated if sufficient separation is obtained, and much pain can be avoided if the tooth is held firmly and immovably by a separator properly adjusted, and the malleting is done in the direction of the long axis of the tooth.

The finishing of a cast filling is much easier on the patient than that of a malleted filling, although in the latter it is reduced to a minimum by the Black knives and Wedelstaedt files for removing the excess of gold at the gingival portion of the cavity.

A medium-setting cement mixed to the consistence of cream will give ample time to get the inlay into position. The inlay can be forced home by means of a pine stick, and it should be held firmly until the cement crystallizes. If the lines of a cavity are definite, an inlay does not need to be rocked to place; too many inlays are rocked out of position by this method.

Summing up: The cast gold inlay has its place as a filling material in dentistry. While its adaptation to the cavity walls is made perfect through the medium of cement, time alone will prove its worth as a preservative of tooth structure.

We have noticed that the cement dissolves around an inlay for a certain distance, and then this action apparently ceases. If it is possible to reburnish the gold to the cavity margin and make a watertight joint it will improve the situation somewhat, but it is impossible to say whether a recurrence of decay will begin at this part of the cavity. What is accomplished in one mouth may not be attained equally well in another. At the present time it is the opinion of the writer that if gold is to be used, the cast filling is preferable in all classes of cavities in the bicuspids and molars of patients of highly wrought nervous temperament, in invalids, in cases of absorption of the alveolar process, or of loss of the soft tissues by disease, in conditions

of weak pericementa, frail cavity walls, and in large restorations which if made with foil would be too exhaustive for both patient and operator. It would also seem important to test the reaction of the saliva to establish some idea of the rapidity with which the cement will dissolve. In patients of less sensitive temperament, malleted gold fillings meet all the requirements of a serviceable restoration in approximo-occlusal cavities of moderate size, in occlusal, lingual, and buccal cavities of the bicuspids and molars, and in inconspicuous portions of the anterior teeth. In the application of either method, however, success will depend upon the operator's honesty, intelligence, and skill.

CORRESPONDENCE.

SOME EXPERIENCES WITH "TARTAR SOLVENT."

To the Editor of the Dental Cosmos:

Sir,—The discussion following the report of Dr. Dunning on Dr. Head's "tartar solvent" (see Cosmos for November 1909, pages 1323–28, moves me to write this communication.

I gave a clinic on "A Method of Using Tartar Solvent" before the Illinois State Dental Society at Danville, and a number of members of the society at that time reported to me cases of burning of the mouth, etc., and there seemed a very decided opinion against trying it any further.

The method I advocated was to place about ten drops in a small wax cup, and when it had crystallized, which it will do in about forty-eight hours, dry the gum, and then picking up a crystal of suitable size on a slightly moistened quill toothpick, pass it down into the pocket as far as it will go. It dissolves slowly and can be pushed home very readily. I know Dr. Head says that the crystals dissolved in water are not so potent, but this is not dissolved except by the secretions of the pocket itself. Constant use of it in this way for nearly a year now has made me firm in the belief that all the results necessary can be obtained, with no possibility of ill effects.

Allow me to give the history of one extreme case: The patient, male, about thirty-five years of age, demonstrated the condition of his mouth when he came into the office by wiggling the lower incisors with his tongue. I found the lower centrals in the worst condition, although there were extensive pockets with copious flow of pus around a number of his other teeth. The slightest touch brought up pus. The treatment consisted in passing crystals into the pockets and leaving them while I treated several other teeth the same way; coming back to the centrals I removed all the deposits possible at that sitting, placed more crystals in the pockets, and dismissed the patient. No effort was made to fasten them in any manner, although after each sitting they were about ready to drop out. I did not doubt that, by doing so, results would be obtained more quickly, but I wanted to see just what could be done in this extreme case. They were treated this way twice a week for six weeks. They were then practically firm in their sockets, there was no pus, nor was it possible to pass an explorer between the gum and teeth anywhere. After an absence of six months the patient was called in for inspection. One of the laterals still had a very slight motion, the other was firm as a rock; the gums were normal. The remainder of his teeth were in perfect condition.

This was an extreme case; I have had others almost as bad, and the results were uniformly good.

In the discussion of Dr. Head's original paper it was suggested that the time might come when the solvent would be incorporated in a tooth-powder or wash. Perhaps my experience along that line may prove of interest. I used in my own mouth a solution of glyco-thymoline and "tartar solvent" in the proportion of ten drops of solvent to an eight-ounce bottle of glyco-thymoline. It kept the teeth and gums in an excellent condition, but at the end of three weeks a peculiar raw feeling developed in my throat which persisted until the use of the solution was discontinued. It then passed away in about forty-eight hours. That was about nine months ago. About a month ago some samples of borolyptol were left at the office, and forgetting my former experience I mixed up some in about the same proportions as with the glyco-thymoline. The result was the same; I was forced to abandon its use in about three weeks because of the same raw feeling, which at no time resembled an ordinary sore throat and which rapidly passed away when the wash was discontinued.

I have felt justified in trying this experiment on but one patient. Because of neglect of his teeth, caused by a prolonged illness making it impossible for him to have them attended to, his mouth was in a deplorable condition. There was not much flow of pus, but a number of the teeth were loose, and the gums were purple and swollen, bleeding at the slightest touch. This, added to a copious flow of saliva, made it very difficult to remove the deposits. Most of the teeth became firm, the gums very nearly normal, and the patient says he "feels like a new man." He has used the glyco-thymoline solution for six months and reports no discomfort whatever. The results in this case, while apparently not so favorable, are fully equal to those in the other case when the general condition of his mouth is considered.

Respectfully,

FREDERICK H. BOWMAN.

SPRINGFIELD, ILL.

PROCEEDINGS OF SOCIETIES.

NATIONAL DENTAL ASSOCIATION.

Thirteenth Annual Meeting, Birmingham, Ala., March 30 to April 2, 1909.

SECTION III: Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects.

Chairman—C. C. ALLEN, Kansas City, Mo.
Secretary—J. W. HULL, Kansas City, Mo.

(Continued from vol. li, page 1419.)

WEDNESDAY—*Evening Session.*

The second session of Section III was called to order by Dr. J. P. Corley, chairman of the Committee on Oral Hygiene, at 8 o'clock Wednesday evening, March 31st.

The first order of business was the report of the Committee on Oral Hygiene, which was presented by Dr. J. P. CORLEY, Greensboro, Ala., chairman of the committee, as follows:

REPORT OF COMMITTEE ON ORAL HYGIENE.

Mr. President and members of the National Dental Association:

The importance of a profession is measured by its possibilities in the service of humanity. Its progress is determined by the class of men who constitute it.

The dental profession have but recently learned that immunity from dental and gingival disease is not only possible but practicable, with all which that means to the human race. The larger task remains of producing a dental staff that will practice and teach this doctrine of immunity. This is the crux and *bête noir* of the situation.

The few men who are fired by a zealous enthusiasm find their efforts thwarted and their energies paralyzed by the apathy and opposition of the official leaders of the organized profession.

Your chairman has persistently besought the National Dental Association to take the matter up in an official way in an effort to enlist the co-operation of all the dental societies in the country in a general crusade for education both of the profession and the public. We have proposed plans whereby the National body, maintaining a strong central committee, could induce each state and local society to create an auxiliary committee, thus covering the territory from the Lakes to the Gulf, but our petitions have fallen on deaf ears.

A few state and local societies have taken up the work in a systematic and practical way, organizing lecture bureaus and creating and maintaining free dental clinics. If these scattered and unassociated forces were corraled, and united into one coherent and well-managed organization, backed hy tbe influence and under the auspices of the National Association, the potential momentum thus acquired would carry the work forward, and make popular dental education an accomplished fact.

Every Chautauqua platform, every teachers' institute, every summer school, every normal college, every educational association, every

superintendent of education and every school board in the United States should be memorialized by the National Dental Association on the importance of instruction in oral sanitation and dental prophylaxis.

Every orphan asylum, every indigent home, every penitentiary, every reformatory, every city school system should have a dental staff; and who, may I ask, could more gracefully request or more strongly influence the introduction of such a *régime* than the National Dental Association?

The work of Koch and his immortal collaborators has demonstrated to the world that the "great white plague" is not only curable but preventable, and the scientific element in the medical profession have so arduously preached the doctrine of pulmonary hygiene that scarcely a child of the United States does not know the value of fresh air and the danger from infected sputum.

The systemic prophylactician is learning more and more to appreciate the dangers from a diseased oral cavity, and the time has come for the application of sanitary science to the gateway of the human body.

The publication of a treatise on the Care of the Teeth by the National Dental Association is a substantial encouragement. We indorse this work and heartily recommend that officers of state and local dental societies be supplied with sample copies at the expense of the National body, and that they be urged to bring the matter before their organizations for the purpose of putting the pamphlet in the hands of the public. Its publication shows that this body is waking up to the work, and will perhaps serve to open the way for a more aggressive and substantial advance in the field of popular dental education.

If a nation's health is her greatest asset, and if a diseased and unsanitary condition of the mouth and teeth is the most common cause of lowered vitality predisposing to systemic decline; if immunity from oral disease is the highest purpose of dental science, if a popular knowledge of the laws of hygiene is a prerequisite to a prophylactic regimen, and if, as we suppose, the National Dental Association represents the *summum bonum* of the dental profession, then in the name of deductive logic and in the common interest of humanity, why does not this association put her shoulder to the wheel?

The next order of business was a paper by Dr. F. A. Johnston, Sheffield, Ala., entitled "Oral Hygiene in Alabama," as follows:

Oral Hygiene in Alabama.

As some of you know, a verbal report of the work done by the Committee of Oral Hygiene was submitted to the Southern Branch of this body last year, and we beg your indulgence for repeating a part of that report in this paper by way of elucidation.

As was stated in that report, we have fallen far short of what we had hoped to accomplish, and we might have long since given up but for the many letters of inquiry and approval received from all over the United States.

It seems that many dentists are fully alive to the importance of oral hygiene, but have been waiting for some plan of campaign to be suggested which they might follow. We are not prepared to say that our method of procedure is a very good one, but it is the best we could find, for as far as we know no one had suggested a successful way of procedure, consequently we were compelled to follow such plans as suggested themselves to us.

We are sorry to say that the dental profession of Alabama has been very indifferent, especially the leading men, from whom we naturally had a right to expect the most encouragement.

Our first efforts were directed toward arousing an interest in oral hygiene among the entire profession. Various means of reaching the public were suggested, the most important path of publicity being through the public schools and colleges.

Dentists were asked to send the names of teachers in whose schools they would lecture, if invited. The committee would then write to the teacher urging him or her to have oral hygiene taught, and suggesting that he invite this same dentist to lecture. By this means no one would be a self-invited lecturer, yet would have pledged himself to lecture when invited. Few dentists complied with our request, but most of the teachers to whom we wrote replied promptly, though no reply was asked for, and expressed themselves as heartily approving our ideas. This was especially true of the presidents of the various colleges of our state.

Of the few dentists who favored us with a reply, some suggested the public press as the best means of educating the public, some thought that the chair was the only place, some could not lecture, and a few others agreed to lecture. All except the few who consented to help forgot the truth of the saying that whatever reforms are to be introduced in a nation they must begin in its schools, that the schools are the only place where all classes can be reached, and that at a time of life when the most lasting impressions can be made.

How many present would now have nearly perfect dentures instead of crippled ones had they only had the proper teaching as to the care of the oral cavity when between the ages of six and sixteen? Damage has been done that no hand, be it ever so skilled, can repair. And who shall say to what extent contagious and other diseases have flourished because of unsanitary mouths?

It has been an exception when a teacher has failed to manifest a lively interest in our work. Teachers are always eager to accumulate useful knowledge for themselves and their pupils, and so we have expected nothing less than a hearty welcome from them.

In every school in which we have lectured, we have been given a hearty welcome and the best of attention, and in some of the schools we learn that an examination was given, and questions were asked so as to bring out all the important facts that had been taught.

This year a directory of the schools was secured through the kindness of the state superintendent of education, and a circular letter setting forth the importance of oral hygiene and urging teachers to invite dentists to teach in their schools, was sent to each teacher, five hundred in all. Owing to unavoidable hindrances, these letters were not sent out until recently, but we trust that they will do much good.

The greatest obstacle we have to overcome is the indifference of the dental profession. While we would not discourage other means of reaching the public, we fully believe that the greatest good can be accomplished in the schools. Fossils neither in the profession nor out of it can be reformed. How many of you ever taught an old man or woman to brush the teeth?

That the general public is wofully ignorant of the importance of oral prophylaxis must be apparent to all when we remember that more than fifty per cent. of the most intelligent people of our country do not take sufficient care of the teeth to avoid the loss of some of them in early life, and often give no attention to the teeth of their children until an ugly dark spot is seen on the child's tooth, or what is worse, the little one complains of pain.

Who in the dental profession has not observed the expression of surprise on the intelligent mother's face when informed by the dentist that the first permanent molar in the child's mouth is not a deciduous tooth but a permanent one, and should not be removed, though she has brought a little one to the office for that purpose?

Who of you have not seen the intelligent man or woman, faultlessly dressed, with perfectly kept hands, face, and hair, and who could discuss intelligently almost any topic of the day, but whose mouth was a very cesspool of filth, and whose breath was so repulsive as to almost stagger anyone who came within its range? Yet this particular class always has far-reaching powers. Such a person has not swallowed a clean mouthful of food for months, or probably years, and the air which they inhale is always contaminated. We speak of this, not in order to condemn those who are thus afflicted, for they are usually unconscious of the existence of such a condition, but rather to show where the fault really lies. No thoughtful person would willingly tolerate such a condition about him. The fault lies with the dental profession, and we as dentists should wake up and teach the people of the danger to the general health from such oral conditions.

If such a condition exists in the mouths of intelligent cultured people, what must be the condition of the mouths of those too ignorant to seek the services of our profession? Will our brother prac-

titioner, the physician, ever wake up to the importance of seeing that his patient's mouth and teeth are well cared for while confined to bed, or will he continue to allow his patient to believe that strong medicines ruin the teeth? Of all times in life when the mouth and teeth should be well cared for, the most important is when people are sick.

It is with shame that we confess that a great many dentists, some of them standing high in the profession, go about their work daily with mouths as unsanitary as those which we have tried to picture to you. What is precept worth when such an example is set? We do not contend or believe that a sanitary oral cavity is a panacea for every ill, but we do believe that it plays a very great part in the health, the happiness, and the longevity of the human race, and that there should be a general awakening as to its importance, first among dentists, then among physicians, and last, but by no means least, among the laymen.

Who in the dental profession who has studied the development of the face and jaws and the effects of adenoids, arrested development, etc., on the entire physiognomy, does not daily see one or several persons, as he meets them on the street and at public gatherings, the beauty of whose face is spoiled by imperfectly developed jaws, by a twisted or otherwise imperfect nose, by irregular teeth, or some other imperfection that might have been prevented by the co-operation of dentist and rhinologist, had the child been treated at the right time.

When dentists do their full duty, children will find their way to the dental office early in life. When all these imperfections are observed early in life, the parents' attention called to them and proper treatment instituted, then faces that would have been deformed and weak will be made to grow strong and beautiful.

We earnestly appeal to all who love humanity and wish to render the best service possible to their patients to enter heartily into this work. When you practice preventive dentistry as enthusiastically as you now do reparative work, there will be far fewer crowns, bridges, and plates to be made, and yet you will never be without work to do.

When we can get dentists to take as much interest in preventive dentistry as they are taking in inlays and crowns and bridges, we will have no trouble in teaching the public.

We wish to make an earnest plea for the hearty co-operation of the entire profession in advancing knowledge on oral hygiene, thus adding to the health and happiness and longevity of the human race.

[After the presentation of Dr. Corley's committee report and of Dr. Johnston's paper, Dr. P. G. White's paper was read, prior to conjoint discussion. Dr. L. C. Taylor's paper was later introduced and was also embraced in the discussion. Closing remarks by Drs. Johnston and White on their respective papers will be found at page 77.]

The Chairman here announced the reading of a paper by Dr. Paul Gardiner White, Boston, Mass., entitled "What We Have to Give."

[This paper is printed in full at page 37 of the present issue of the Cosmos.]

Discussion.

Dr. W. E. Walker, New Orleans, La. I did not expect to be called upon to discuss this subject of oral hygiene, and I therefore apologize in advance for any remarks that may ill become our National body. But the subject is of so much importance that I cannot decline, even though I am tempted to do so.

I must take exception to the statement that the text-books of the public schools contain nothing on the subject of oral hygiene and prophylaxis. Krone's Hygiene contains a very much better chapter on this subject than I expected to find, judging from other school books. There are some errors in that chapter, to be sure, but the book should at least be given credit for offering a chapter on this subject. I must also say, and more forcibly than the essayist did, that we need lectures a great deal more than we need a chapter on oral hygiene. Contrary to his statement, I have found by asking children attending schools in

which Krone's Hygiene is used, that they seldom studied the entire book during the school year, and that they rarely saw the chapter on oral hygiene at all. They almost always skipped the chapter on oral hygiene, not thinking it an important subject. I would therefore say that simply having such a chapter in the book is not sufficient. Lectures to stimulate interest in this subject are of more importance than a chapter in the school books. I have reference, of course, to the right kind of lecture, properly delivered.

Dr. G. V. I. Brown, Milwaukee, Wis. I would regret the fact that I have had no opportunity to prepare for the discussion of this paper, had not the essayist in my opinion covered the subject so fully that he has left very little necessity for any preparation. In discussing the prevention and cure of oral diseases, we quite unconsciously limit ourselves as a rule to a few underlying fundamental principles that are constantly observed when we look into the oral cavity. We all know that these principles represent a very small proportion of our responsibility, but ordinarily we fail to convey the idea that we are aware of having a greater obligation to all who come to us for consultation. Those who will ultimately settle this question will probably not be doctors or dentists, but the great masses of people whom the essayist has termed the laity. When we succeed in making the people themselves appreciate the importance of oral surgery and understand what we can do for them and what they can do for themselves, then the problem will be solved.

I was pleased to note that the essayist called attention to the fact that questions which pertain to better breathing, better oxygenation, and better general health have much to do with prophylaxis as we understand it; he has also pointed out the merely germicidal action of drugs used in the mouth or of methods pursued in cleaning the teeth. While I do not wish to decry the latter view of the question, it is, after all, secondary to the other very great principles that we should try to put forward.

I congratulate Dr. Johnston upon having presented the subject in so useful a form. Undoubtedly, there is unanimity of opinion at this meeting as to the desirability of carrying forward this work. The only question is, How shall we do it? I believe that great good can come from wide dissemination of this knowledge, no matter how it may be done, and in my opinion that is the sum and substance of what we are to consider tonight.

Dr. Wm. Conrad, St. Louis, Mo. I wish to compliment the chairman of the committee, and also the gentlemen who prepared the papers, upon the quality of their remarks.

As long as many dentists clean teeth at prices ranging from twenty-five to fifty cents, and oftentimes for nothing, the dental profession has to be educated first, before they are capable of educating the people. It is a fact that there is a result which never fails the conscientious follower of oral and dental hygiene, and that is, that perfect, positive, and continued immunity from the ravages of caries can be prevented forever. But to do that, the intelligent dentist must have charge of the patient from the time of the eruption of the first tooth until the time of the death of the patient. This is a serious fact, because the ordinary as well as the unusually talented and intelligent person is unable to take proper care of the teeth without the assistance of some capable dentist. Therefore, I claim that the first thing to do is to educate the members of the National Dental Association.

One gentleman spoke of the poor care that people take of themselves. I am, however, very happy to say that the people of the United States take better care of their teeth and of their persons today than they ever did. It is the pride of good intelligent people to take care of themselves, and consequently of their teeth. They like to do so and wish to know how, and they are perfectly willing to follow our advice. I do not believe much in infection caused by food particles left in the mouth. I do not think that the human system is very much injured by these particles, because many of

you will remember children and women and men who only brush their teeth on Christmas-day, and are perfectly healthy.

One gentleman spoke of the twenty millions of children in this country who need attention. With very little trouble and with but little care, supervised by a corps of intelligent working dentists, these twenty million children could be protected from dental caries, as I said before, forever.

One of the essayists remarked that the dentist should have the care of the teeth from the sixth to the sixteenth year. The dentist, however, should have care of the patient from the eruption of the first tooth until the end of life, not from the sixth to the sixteenth year. At the Chicago Odontographic meeting held in January last, one of the questions asked in the discussion on operative dentistry was what the essayist would do if a case like the following presented: A patient, eight years of age, presents the first permanent molar tooth decayed almost if not entirely to the pulp. I told them that I thought such a question to be entirely out of order; that no respectable dentist should ever be called upon to treat a tooth of that character in a patient of that age.

Another essayist, if I understood him correctly, made the remark that it was impossible to educate old men and old women as to how to take care of their teeth. I do not believe a word of this. A person is never too old nor too young to be taught cleanliness and healthfulness.

There is another point that I wish to speak of, and that is the question of refraining from extraction, which comes under the general head of oral and dental hygiene. I hope to see the day when no tooth will ever be extracted by a reputable or non-reputable dentist, unless the tooth can be removed with the thumb and finger. The greatest crime that the dentist has perpetrated upon the human race is the extraction of teeth. No matter whether you extract one tooth or six teeth from the mouth of any patient, that mouth is crippled for life, and many times the face of an otherwise beautiful woman is marred for life. Therefore I wish to raise a loud protest that "no extraction" should be the motto of the members of the dental profession and of the members of the National Dental Association.

In regard to the second and last point upon this subject generally, it has been in my power in the past to bankrupt many of the most distinguished and celebrated orthodontists in this country. This is a subject that must be considered by the general practitioner, by the practitioners of any of our specialties, and more particularly by the practitioners of the specialty of orthodontia, namely, the decay of the teeth following and accompanying the practice of orthodontia. I have been unfortunate enough to see patients coming cured as far as the correction of irregularities was concerned, from the hands of one of the most distinguished and celebrated orthodontists in the world, but by actual count I found fifty areas of caries in one single mouth. There is not one orthodontist today who does not have caries accompanying and following his work, and from now on let him beware of me! I will no longer lie to patients when they ask me if such caries is not due to carelessness and to the filthy character of their mouths when they were under the care of the orthodontist. It is possible to finish the operation of regulating any set of teeth, no matter whether the time necessary is one month or six months or ten years, with the teeth coming from the hands of the orthodontist more perfect, and with the mouth in a more healthy condition after the completion of the operation than before the orthodontist began.

The Chairman then announced as the next order of business the reading of a paper by Dr. L. C. Taylor, Hartford, Conn., entitled, "Dentistry, Past and Present, as Seen by a Modern Hygienist," which would be discussed with the other papers already presented. Dr. Charles McManus, Hartford, Conn., read Dr. Taylor's paper.

[This paper is printed in full at page 42 of the present issue of the Cosmos.]

Discussion.

Dr. N. S. Hoff, Ann Arbor, Mich. Dr. Taylor has given us a very brief glimpse into the past of dental practice, showing that it has been largely confined to efforts to repair the ravages of diseases which have attacked and crippled the masticatory organs, and he asserts that something more is expected from the profession of the present century. He intimates that oral hygiene has not been given the serious attention that it should have received, and that we have cultivated the technical to the exclusion of the more essential and promising hygienic fields of research and practice.

Undoubtedly, much time and effort has been spent in developing methods of mere technical repair, but it is also true that thoughtful men all along the line of progress have sought to know the cause of dental caries, for instance, and a grand record of research as well as result has accumulated, from which we are today profiting and upon which we are building our methods of hygiene. The essayist makes a very true and wise observation in the statement that orthodontic interference in the formation periods is contributing largely to the better hygienic possibilities. We are very certain that he has struck in a too feeble manner the keynote upon which a grand symphony could be constructed that would quickly occupy its place as one of the classics in our professional archives. If we are to hope for a diversion of our profession from its present intense striving for excellence and supremacy in technical achievement, it must necessarily be made possible by the development of a grade of tissue with a higher resistance to infective invasion. It would seem logical that greater immunity should follow a typically normal development of tooth tissue and the ideal arrangement of the teeth in true anatomic form and relations. This ideal is the inevitable conclusion of every follower of the new school of oral prophylaxis, and one comes to feel that restorative achievement only, while of the greatest value and service when needed, can never satisfy the higher conceptions of duty to humanity. It has come to be almost a passion with the practitioners of true oral prophylaxis, not only to eradicate all disease from the oral cavity, but to replace in typical form and physiologic function all damaged and lost dental organs. How much more satisfactory would it be if we could save every tooth in full integrity and in true anatomic relation. Such an ideal may seem impracticable, and an impossible task, but none can say that it is unworthy. May it not therefore be worth while for us to keep this ideal before us as a kind of laudable ambition, even though it may seem impracticable of realization? We should like to have a number of the younger practitioners, who have the opportunity as far as time is concerned, select a limited number of children whose parents are willing to place the welfare of their children's teeth in their charge, and let them undertake to demonstrate the fact that the teeth should not be appreciably affected by caries until they have reached the usual age of immunity. We confidently believe that children can be carried to the age of say twenty-one years without the loss of a permanent tooth or without appreciable disintegration from caries, or permanent disease of the gums, simply by the intelligent practice of orthodontia and oral prophylaxis. Orthodontic interference may not always be necessary, but practically every mouth that has been left to mature without some such assistance is likely to present some slight malposition that serves to invite detrimental deposits or provide vulnerable points of attack for carious agencies. Consequently there is a fundamental necessity for early orthodontic surveillance, at any rate.

The essayist makes the statement that a healthy body is accompanied by normal occlusion of the teeth and a capacity and habit of normal respiration. This is of course an observation that may in general be true, but it will be difficult to substantiate it scientifically without some extraordinary form of research that up to now has not been made. If, however, we are to place confidence in the

statements of Mr. Horace Fletcher and Dr. D. D. Smith, we will be forced to conclude that various systemic disorders have been restored to normal function by thorough mastication of food and oral prophylaxis treatment when medicinal and other remedial agencies have failed after long and faithful application. We ourselves have some convincing data on this matter, of such a character that we are sanguinely hoping for greater evidence after further experience. In fact, it is this evidence that has been so convincing in the treatment of somewhat desperate conditions of the gum environment of the teeth in pyorrhea alveolaris that makes us so certain in the conviction that by a right preventive treatment practically no teeth should be lost either by caries or alveolar pyorrhea.

We wish also to commend another statement of the essayist, namely: "The future dental practitioner must become a teacher in fact rather than a quoter of hygienic precepts." The essayist makes this statement in connection with a reference to the prescribing of mouth-washes and tooth-powders empirically. We have all found that no single treatment will serve all, even similar, conditions to the best advantage. We must study the mouth toilet with a view to adapting it individually, and much effort and time, if need be, must be given to instructing each and every patient as to his individual needs. This will involve a much more frequent inspection of our patients than is now customary, and necessarily it will enlarge our responsibilities. But we confidently believe that it will redound to the honor and glory of our profession and conserve the health of our patients.

Dr. M. L. Rhein, New York, N. Y. Judging from the interest evinced in this paper the principle of preventive dentistry has undoubtedly taken a firm hold on the profession at this time. It has been said on a number of occasions during the past few years that the future province of the real doctor will be to prevent disease instead of curing it, and it is one of the philanthropic acts that our specialty can boast of, that for a number of years we have been preaching this doctrine. It is true that for a long time seeds have been sown in soil that has not been very well cultivated, but the fruits of it are showing more and more as the years go on. While a few years ago the men who were practicing this special work and endeavoring to instil the importance of it in the minds of the public were in danger of meeting with pronounced opposition from members of the profession, at the present day it is safe to say that it would be a very injudicious man who would attempt to deny the benefit of prophylaxis as understood by us at the present time. It is wise, however, that we as a profession in dealing with this subject should handle it with due regard for scientific truth. There have been a great many remarks made about the obliteration of bacteria in the mouth, and we recognize the fact that it is an impossibility to obliterate the bacteria that invade the oral cavity. We may get rid of them for a moment, but they reappear very rapidly. In other words, it is not a question of removing the bacteria, which is a physical impossibility, but of leaving the oral cavity in such a condition that the bacteria have no place to lodge and to exert their injurious effects. In educating the public this subject should be presented to them in an effective manner. When urging upon them that by keeping their mouths clean they will be less liable to possible disease, I usually compare the condition in the oral cavity to the bottom of a boat left unclean, saying, "If you will consider the boat with its aggregation of barnacles on the bottom, you will get a fair comparison of the condition that the enamel of the teeth assume if these bacteria, which are not visible to the naked eye, have had an opportunity to plaster themselves and glue themselves upon the surfaces, millions upon millions, until finally they assume a corporate existence in the aggregate, and we can see them with the naked eye." In this way I believe I am able to give the layman a more correct idea of what the bacteria are able to accomplish when left to themselves in the ordinary unhy-

gienic mouth. This comparison of the barnacles on the boat to the bacterial plaques is one that generally appeals to the intelligence of the layman, and it is along lines of this kind that I feel the appeal should be made to the profession. We should be careful not to make statements that the scientific facts will not corroborate.

It has been truthfully said in the last essay that mouth-washes and preparations of that nature are of very little value in prophylaxis. They are just an aid to keep the surfaces of the teeth in the condition in which the operator has left them until he can again see the patient, and the time that should elapse between these visits varies in different cases. There are mouths whose conditions are of such nature that the self-protecting and self-cleansing properties permit a longer interval of time to elapse. Again, there are people who will heed the advice given to them and devote the necessary time with the brush manipulated in the proper way, so that every surface of every tooth and the gum over the roots of the teeth are massaged and brushed so carefully that they can allow a greater interval to elapse. We must have patience with the class of people whom it takes time to educate in regard to the necessity of time and care that they themselves must spend. I feel that in this respect we have been lax in our instruction, and have not emphasized enough the amount of co-operation which the patients themselves must give to the operator in this repsect.

I do not feel that I should take any more time in discussing this subject, which is very near and dear to my heart. It is a great pleasure for me to see the public interest manifested here tonight in this subject. We know what prophylaxis means for the future welfare of the teeth of humanity, and if we will use our individual efforts in the education of the public, they will soon realize the futility of dental operations performed in an unclean mouth.

Dr. Wms. Donnally, Washington, D. C. I wish to congratulate the section on the interest and attention given to this subject, and while there is yet a large, enthusiastic, and intelligent audience present, I want to make a motion that it is the sense of this assemblage that the Committee on Oral Hygiene should be appointed by the proper officers, either the president or the Executive Council, before the sessions close. I make this motion for the reason that Dr. Corley did not know that he was chairman of the committee until it was recently announced in one of the journals, and I know from experience that it is highly important that the work should be begun at the very beginning of the new year, and that it should be continued throughout the entire year to yield the best results. I am not reflecting on the results of this six weeks' work; on the contrary, it is grand, and I congratulate the association on the result of the committee's effort as exhibited here tonight, but I will say that we do our committees and the interests committed to them an injustice by deferring their appointment for many months, and the announcement of their appointments for many more months afterward. I insist that this motion is an important and appropriate one under any circumstances, and that it should be passed on its merits and without reflection on anyone.

The motion was seconded and passed.

Dr. J. D. Patterson, Kansas City, Mo. The association at its meeting last year authorized the publication of the pamphlet a copy of which I hold in my hand, and which many have seen. This pamphlet was rapidly carried to completion and is ready for distribution. As chairman of the committee I have had it published in the dental journals, together with information in regard to how it could be secured. The action we took last year is certainly an entering wedge, and if each individual member of the association will provide himself with a sufficient number of copies for his patients and for distribution in the proper places in the bailiwick in which he lives, it will help that wedge along. For myself I have distributed in our city some three hundred copies, two hundred to one kindergarten school and the others

among my patients; and if you will do the same, you will help to promote this good cause just a little further.

I wish to make the motion that this association place into the hands of the Committee on Oral Hygiene five thousand copies of this little pamphlet for distribution at the expense of the association, in communities where they think it will do the most good, and I trust that I can get a second to the motion, and that it will be carried.

The motion was seconded and carried.

Dr. W. G. Ebersole, Cleveland, Ohio. For a number of years I have been endeavoring to obtain some power in the state of Ohio whereby we could have examinations made in the schools of the condition of the pupils' mouths. Within the past few months the chamber of commerce of Cleveland has become interested in this work. The board of health and the school board of Cleveland had been at loggerheads on this question for a number of years, and were unable to do anything. The hygiene committee of the chamber of commerce took the matter up, however, and became interested to know the oral conditions of the school children. In order to learn the oral conditions existing, it became necessary for the district physicians to make examinations of the children. The head of the board of health commissioned the district physicians to make these examinations, which were made in this way: The school children were lined up in a row and marched past the examining physician, who glanced into each mouth, first at the upper and then at the lower portion of the mouth, and in this way they were able to examine hundreds in a short time. It was most striking that even upon such a superficial examination over seventy-five per cent. of the mouths of the children in our schools in Cleveland were marked bad, many diseased. With the data secured in that way the board was able to go before the chamber of commerce showing the absolute necessity for action. I wish to say, however, that what we have secured in Ohio is not due to the efforts of the dental or the medical profession directly, but to those of the committee on hygiene of the chamber of commerce of Cleveland. With the data secured, the two antagonizing boards, the board of health and the school board, have been brought together, and within the past two weeks we have been able to pass a law, which is not as we want it, but the best that we could obtain under the circumstances, a copy of which I herewith submit:

(Senate Bill No. 120.)

An Act to supplement Section 4018 of the Revised Statutes of Ohio, relating to general duties of teachers, by a section to be numbered 4018a providing for the health of pupils of public schools.

Be it enacted by the General Assembly of the State of Ohio:

Section 1. That section 4018 of the Revised Statutes of Ohio be supplemented as follows:

Sec. 4018a. Any board of education in a city school district may provide for the medical inspection of pupils attending the public schools, and for that purpose may employ competent physicians and nurses and provide for and pay all expenses incident thereto from the public school funds, or may by agreement with the board of health or other board or officers performing the functions of a board of health for such city, provide for medical and sanitary supervision and inspection of the schools which are under the control of such board of education and of the pupils attending such schools, by a competent physician selected by the parent or guardian of the child, but in case of failure upon the part of the parent or guardian, then by the district physicians and other employees to be appointed by such board of health, and any board of education in a city school district making such agreement shall have power to provide and pay compensation of the employees of the board of health, in addition to that provided by the city.

Passed March 12, 1909. Approved March 15, 1909.

Judson Harmon, *Governor.*
Francis W. Treadway,
President of the Senate.
Granville W. Mooney,
Speaker of the House.

Nothing is said in this law with regard to dentistry, but the sole purpose of having it passed as it is was to establish

a condition permitting inspection to be made, and this law permits the school board to act in the matter.

I wish to emphasize that people outside of the dental and medical professions are taking this matter up, and it is high time that we do something ourselves in that work.

Dr. J. Y. Crawford, Nashville, Tenn. So much has been said of the presence of bacteria in the mouth, and on the subject of infection, that the public when they come into your office and are asked if they believe in the germ theory of disease, will say, "Oh, yes." When you ask the next question, "Do you understand and appreciate the fact that whenever there is disease by infection there must be a port of entry?" they will answer, "No, I do not understand that." Neither medicine nor dentistry nor the laity recognize the following fact—which I wish to impress upon you: It is strange that the dental surgeon, who has been looking for these centers of infection around the third molars, or the medical man, who has searched for them in various throat troubles, has never stopped to think that in a child's mouth from the eruption of the first tooth until that of the last tooth of the first set, covering a period of eighteen or twenty months, there are twenty openings in the mouth for the introduction of germ life. That in my judgment is the port of entry that more frequently admits dangerous infectious diseases of childhood than any other portion of the organism. With this thought in mind, I have for the past twenty years offered a chromo to any physician who would bring to me a case of diphtheria or scarlet fever in any edentulous child's mouth, and I have not seen one yet. Every member of a family where there is one child with an edentulous mouth may have scarlet fever or diphtheria, but that edentulous child will not contract it. I would not say that there has never been such a case, nor that the mouth is the only avenue of infection, but it certainly is the principal avenue. This fact has impressed the importance of this subject more forcibly upon me than any other observation that I have made in my life.

Dr. Herbert L. Wheeler, New York, N. Y. The fact that the National Dental Association has taken up the question of dental hygiene is a most encouraging sign. They are beginning to take the proper position, starting at the fundamentals. The experience that we have had in New York leads me to believe that there are not enough dentists in America to attend to the carious teeth in the city of New York alone, and unless we arrive at the point where it will be possible to prevent some of this trouble, the situation is hopeless. The only way of successfully coping with the situation, as has been said here tonight, is to educate the people to the necessity of having a clean mouth if they would have a healthy mouth, although I am quite sure that the present knowledge of what causes the destruction of the human teeth is not sufficient for any dentist to say that it is possible to have in every mouth absolutely clean teeth, which I do not believe. In practicing exclusively among people who are able to pay dental bills without regard to expense, and who take all the care possible of their mouths and teeth, I find that the children, although surrounded by every necessary appliance and by servants to insist upon proper oral care, exhibit a great deal of caries. The filling of these carious teeth takes a great deal of time. The placing in the books of the schools rules and regulations in regard to the care of the teeth does not sufficiently impress the student or the teacher. It is a well-known fact that at the present time every state has laws requiring that hygiene be taught for a certain number of hours each week, but no text-book is so much neglected as are the books on hygiene.

In New York city, where I took the pains to find out the actual conditions, the board of health and the department of hygiene are attempting by actual comparative methods to find out whether with clean mouths the children show better health and better mental conditions. These experiments are being carried out

in the following way: A certain number of children from some of the schools are sent to the dental clinics, and their mouths are and will be kept in order for four or five years; others living in the same community under the same conditions, but without dental care, will be kept under observation for the same length of time, and at the end of that time we shall be able to decide whether those who have received the attention of the dentist, the nose specialist, and the ear specialist are in better condition than those who have not received this attention. Then we shall be able to speak of facts. At the present time the facts are not known, as statements made here have shown.

A most remarkable condition was shown by the examination of 172,000 school children in New York, namely, that ninety-five per cent. need dental care, and that seventy-five per cent. have never been in a dental office. Dental clinics have been established in the Bellevue Hospital, in three other hospitals, and in several of the schools, and furnished with the best equipment; the city is bearing the expense and would establish many more clinics if it were possible to secure dentists to attend those clinics. A most remarkable fact in connection with this work of establishing dental clinics in New York city is that not one of them has been brought about by the dentists. Personally, I have struggled for three years to induce the dentists to take up this work, but it has only been done in a desultory way. What has been accomplished in New York has been done by charitable organizations and through men who have been interested in social settlements and in the physical development and welfare of the people, and the education carried on in this way has aroused the public to such an extent that they are beginning to criticize the dentist, many times unjustly of course, because he has to be educated as the public is educated. The dentist must therefore take heed of this work unless he wishes to pay the penalty of his neglect, and it is my opinion that unless the local organizations take up this work in a practical way, work on an intelligent basis, and bring their results before the National Association, time, energy and money will be wasted. The National Association cannot carry on this work without having obtained practical facts by practical experience. The Dental Hygiene Council of Massachusetts—and I am surprised that Dr. White did not mention their work in his paper—has accomplished some work in oral hygiene, distributing circulars similar to those issued by the National committee. Many of the men in Massachusetts and in some parts of Connecticut are working in harmony with the school committees, with the charity organizations, and with public institutions such as boards of health, and I assure you it is up-hill work. All that has been accomplished is the examination of the mouths of the children of a few schools in Boston, carried on under Dr. Potter, who found that in Brookline, the wealthiest town in America, seventy per cent. of the school children need dental service. Just think what the condition must be in New York, where so many of the people are too poor to buy sufficient clothing! Just think under what difficulties we shall have to labor, and what an enormous amount of labor is involved, if we are to accomplish anything for these children. In one of the clinics in New York the work was taken up by the dentists last October, and has been carried on to the present time, but two dentists working every afternoon five times a week have only succeeded in completing the work in a few hundred children. Look at what we have to face, if we are to do anything for these 172,000 children that have been examined, who represent hardly a quarter of the public school children that need attention in New York city. I merely bring this to your attention to show both sides of the question.

Again let me emphasize that we must get to work on this question in a practical way. Let us first demonstrate how much time will be necessary to carry on this reparative work, and then we must set about to find some way of carrying on preventive dentistry rather than repara-

tive dentistry, and we must educate the public to assist us through their organizations, or else we can do practically nothing.

Dr. WHITE (closing the discussion on his paper). I believe it was Dr. Oliver Wendell Holmes who made the remark that a child's education should commence with his grandfather, and in my opinion we should commence with the children and not with the old men and old women. As has been suggested, when people once have acquired habits of neglect and filth, they are not going to mend their ways after reaching old age. My suggestion of introducing a chapter on oral hygiene in the text-books used in the public schools throughout this country would not cost the National Dental Association nor the publishers of the text-books one cent. While such a chapter would not at the start be productive of as much good as a course of lectures might be, the teachers of oral hygiene in the schools could be made to have the children read the chapter on oral hygiene as well as any other chapters. If the books are laid aside it is not the fault of the books, and it is against the laws of most states, and that could be rectified in the different cities and states where dentists live. I cannot see any harm in adopting the suggestion that this chapter be submitted to various authors of text-books in the United States and be incorporated in the books. It would insure that a uniform course of instruction in oral hygiene would be given in the public schools.

Dr. JOHNSTON (closing the discussion on his paper). Some statements have been made by one or two of the gentlemen in the discussion which I think were rather iconoclastic in their nature. The first was that infected teeth would not poison the system. We cannot take one or two cases to prove anything, but we have all, no doubt, in our clinical experience seen people who had very poor teeth, and who had called upon the physician very frequently without benefit; these same patients after the decayed teeth had been removed have immediately gained in weight and improved in general health. We who live in country districts have seen numbers of cases where there was no doubt that infected teeth poisoned the entire system. As stated in the paper, we do not believe that oral hygiene and oral prophylaxis is the panacea for all ills, but we do know that it is for some of them.

The statement which I made with reference to old people I think to be a true one. There are exceptions to all rules, but old people do not as a rule take up new things. You cannot get people who have lived to the age of fifty years without the use of the tooth-brush to do very much in that line. We must look to the younger generation.

I was misunderstood in what I said as to the care of the teeth from the ages of six to sixteen. I said that many people, dentists, physicians, and laymen, are going through life with a crippled mouth, having lost important, probably the most important, teeth in the mouth, because they have not had the proper teaching at the proper time. I did not intend to lead you to believe that the ages of from six to sixteen are the only periods when care should be devoted to the teeth, but the teaching of the proper care of the teeth in those years would have probably precluded a great number of these mistakes.

One point that I tried to specially accentuate in the paper is that oral hygiene does not mean the saving of the teeth only, but that there are many conditions of the human system that depend more on the care of the oral cavity than is generally believed.

There being no further business before the section, the Chairman declared Section III adjourned until the next annual meeting of the association.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Forty-first Annual Meeting.

(Continued from vol. li, page 1328.)

FRIDAY—*Morning Session.*

(Continued.)

The next order of business was the reading of a paper by Dr. JOSEPH HEAD, Philadelphia, Pa., entitled "Enamel Softening and Rehardening as a Factor in Erosion."

[This paper is printed in full at page 46 of the present issue of the COSMOS.]

Discussion.

Dr. ARTHUR H. MERRITT, New York. I have been greatly interested in Dr. Head's paper. While in Philadelphia last week, I had the privilege of examining some of the specimens which have been the subject of these experiments, and can confirm all that Dr. Head says, although I can do little more.

If I remember correctly, he told me at that time that the rehardening of the enamel took place to some extent when the teeth were exposed to the air only. This would seem to indicate that the recalcifying property of enamel is to some extent resident in the enamel itself, and that the phenomenon is dependent upon two things—the tooth and the saliva. If the tooth itself shares in this phenomenon, there must be some changes taking place within the enamel organ which raise or lower its resistance. That the saliva under favorable conditions exercises a restraining influence upon caries and erosion is a well-known fact. The problem which confronts us in these experiments can be answered only by chemistry, of which it has been said that that which is known is as nothing compared with that which is unknown. Dr. Head has presented facts obtained by long and patient experiments, and frankly admits his inability to account for them.

With our present knowledge, these phenomena cannot be accounted for. That hardening of enamel may occur, I believe he has proved.

I doubt whether the carbon dioxid exhaled with the breath has anything to do with it, for that would not be less when erosion of the teeth is most active. Erosion in its more active forms would seem to be due to nutritional disturbances. I recently saw a case in which nearly all the labial and buccal enamel was stripped from the ten anterior upper and lower teeth; this had all occurred within four years. Inquiry elicited the fact that the patient had given birth to four children within six years, during which time the erosion had taken place. Dr. Head is engaged in splendid work, and if we are ever to know anything about immunity to erosion and caries and its causes, it will be because of such painstaking work as he is doing.

Dr. H. L. WHEELER, New York. When we consider how little is known of organic and physiological chemistry, statements like those made by Dr. Head are easily conceivable. If an inorganic substance like iron by simply heating or by hammering can be changed in its qualities so that the molecules and atoms undergo a change of position, it is not unreasonable to suppose that the qualities of an organic living substance may undergo changes so that they may become weakened, and again become resistive in a manner not understood at present. If an inorganic substance like calomel, which is mercury chlorid, has a different

effect from mercury bichlorid after but a slight change in its molecules has occurred, it is not unreasonable to suppose that a slight change in organic living tissues may also change its qualities. The difficulty of experiments upon teeth out of the mouth can be represented by the difference between shoe leather and the skin of your foot. Both are skin; the leather is a dead skin which has gone through a process and wears out, but the skin on the soles of your feet is not worn out, or, if so, it is done gradually, and it is replaced gradually by processes of nature. This indicates that experiments made upon teeth out of the mouth will never solve the problem of the qualities of the teeth in the mouth, which are connected with the living tissues of the whole organism, for teeth in the mouth are not only composed of calcium salts which we can analyze by various methods, but also of an organic matrix which has various qualities, and is a living vital tissue. This organic matrix is sometimes apparently mysteriously dissolved, while in other instances it holds the calcium salts together so strongly that the teeth are largely immune from outside influences or disturbances of any kind. At other times, in the same mouth, the same dental tissues are apparently readily destroyed. All of you have seen cases in which the teeth seemed to be immune from the inroads of decay for a period of years, when suddenly, for some reason not well understood, decay and destruction went on rapidly. What has happened? Is it external influences exclusively which cause the destruction or a change in the inherent qualities of the tooth structure? That has not yet been decided. It is my belief that both play a part, and that the qualities of the tooth substance itself are as important as external environments. You have noticed in treating cases with the ethereal solution of hydrogen dioxid for bleaching the teeth, that the skin on your hand, if you spill a little of the solution, turns white, and apparently becomes what we would consider lifeless, yet in a few minutes sensitivity reappears, and the skin becomes normal again, the tissue to all appearances being vital and healthy. Is it not possible that the tooth structure, although harder and possibly less liable to the effect of external conditions than the skin, may at times under the influence of its environment lose some of its power of firmly holding the calcium salts in position, and that certain conditions may occur which bring it back to normal condition, when the molecules and atoms of the tooth substance or calcium salts are firmly held in place? Here is a question well worth the study and consideration of the chemists of the profession.

In regard to erosion, I have observed that at times it goes on rapidly, and again there seems to be immunity, and the tissues remain stationary as it were. I believe from clinical observations that the tooth-brush plays little or no part in the question of erosion or wearing of the teeth, unless there is a condition first which brings about a dissolution of the calcium salts. Whether the calcium salts dissolve or whether the condition of the organic matrix renders easier the removal of the calcium salts by friction, I do not know, but it is evident to my mind that unless some such change occurs in the strength and firmness with which the inorganic structure of the teeth is held together, the tooth-brush will not cause any injury. If, however, such a condition has been established, the tooth-brush may aid in wearing away the tissues.

These questions should be considered carefully. To be sure, a knowledge of organic, inorganic, and physiological chemistry and much experimental work is required. I trust that such papers as Dr. Head's and Dr. Talbot's of this morning will be a stimulus to our profession to get away from the position of the "man with the hoe," and to closely consider the relationship of the teeth to the human organism.

Dr. E. S. Talbot, Chicago, Ill. The last speaker has covered the ground so thoroughly that I have little to say. I can relate in this connection the following two cases: A young man had an abscess of the pelvic cavity, and within three months the enamel rods broke

down, and two fillings in the anterior part of the mouth fell out. The other case was that of a gentleman of sixty-two years of age, who had a nervous break-down as a result of which the enamel rods around four fillings in the anterior portion of the mouth broke down and allowed the fillings to come out. Such cases are not unusual, and I believe firmly, after many years' experience, that auto-intoxication through the blood has much to do with bringing about the conditions which Dr. Head mentions in his paper.

I want to congratulate Dr. Head on his excellent work, which is worth more than all theorizing. I hope he will take into consideration the systemic relations in connection with his researches.

Dr. R. H. Hofheinz, Rochester. Dr. Head has recently presented to the professon a few paradoxes which, if a less able man had offered them, would have been laid aside with a supercilious smile.

His hydrofluorid of ammonium has astonished us, owing to the assertion that it dissolves tartar but does not affect the cementum. I can heartily testify to its ready dissolution of tartar, but I must as yet simply accept the report of his observations as to the effect on the cementum.

Dr. Head says: "Miller and many others in producing artificial decalcification by solvents, in employing water solutions of acids varying in strength from one-half to two per cent. have exposed their tests to two serious objections. First, that the solutions found in the mouth are saliva solutions, not water solutions," etc. I spent a large part of my time with Professor Miller shortly after he had made his experiments on artificial decay. I might not have trusted my treacherous memory; when, however, a special delivery brought Dr. Head's paper to my house at two o'clock in the morning, I felt in duty bound to get even with him as far as possible. On page 196 of his book on the "Micro-organisms of the Human Mouth," Miller says: "The chief object of my experiments was to produce microscopic appearances of decay, since it had already been proved by Magitot that by various means macroscopical appearance may be produced. I cut up a number of teeth which were sound, but of different density, and placed them in a mixture of bread and saliva. This mixture was kept at a temperature of 37° C. The border of the enamel was rough and at many places so brittle that an instrument could be inserted between the enamel and dentin." This would show that whatever experiments Miller may have made with water solutions later on, his first great and fundamental deductions were based on saliva solutions.

What Dr. Head has artificially proved, we have all more or less observed in the mouth. In my section at the St. Louis Congress I reported a most remarkable case of erosion of the teeth, followed by a rapid cessation and complete hardening of the surfaces. Dr. Head has proved one fact without a doubt, namely, that if this phenomenon of rehardening of enamel takes place, it must do so in connection with the saliva.

The other question which presented itself to me is, To what extent is the organic matrix responsible for this change? What result would Dr. Head have obtained if he had run a file across the tooth, cutting the Nasmyth's membrane, which contains a large part of the organic matrix; would he have had a readjustment such as he found in his other remarkable experiments?

It seems to me that if anything justifies our belief in environments, Dr. Head's experiments give us the fullest right to do so.

Dr. H. C. Ferris, Brooklyn. I am more and more impressed with the fact that not enough is known of the chemistry of the saliva as it exists in the mouth. Everything that has been said leads to that particular point—we are trying to solve these problems without first knowing what the normal condition of the saliva is. We make an examination of the saliva for acidity, and we find that it contains free and combined acids. We can study a given case through a series of treatments and note the changes in the free acid action extending over a period

of several months, and we can determine whether that acid condition is improved or whether it is increased. In the examination of teeth as Dr. Head has carried it out, water solutions I believe give us the most definite results, because of the complex condition of the saliva when out of the mouth. Saliva, if left in a test tube for a short time, will develop bacteriological action, and the acid condition will multiply, therefore experiments carried out with saliva extending over two or three days without an endeavor being made to keep it at body temperature increase its acid formation, free acid accumulating in such a specimen. I have records of many cases in which salivary analysis was made in connection with the treatment of the oral conditions. I have noted in particular a case of orthodontia extending over a period of nine months, in which chemical analyses of the saliva and the urine were made from week to week, and, while the technique was inferior to a certain extent, the examination was uniformly carried out and showed the relative changes in the saliva and the urine. It proved that when the pathological conditions in the saliva disappeared the pathological conditions in the urine also disappeared. The record of that case, comprising a period of nine months, should serve as a lesson that these conditions are to be considered.

We must, then, consider the normal condition of the saliva as found in healthy cases, and avail ourselves of the pathological conditions as a diagnostic aid.

Dr. F. W. Low, Buffalo. A word about the normal saliva. If you examine nine hundred and ninety-nine different specimens of saliva, you will not find two alike. Which one are you then going to call normal?

Dr. Ferris. It is true that you cannot find two like specimens of saliva, but it would seem that by careful examination of the saliva carried on simultaneously with examinations of the blood and the urine in order to establish the status of the patient, you could after examining one thousand healthy individuals obtain a ratio which would show the normal chemical conditions in the salivary secretions.

Dr. Head (closing the discussion). I agree entirely with the remarks made, namely, that it is extremely difficult to decide what is normal and what is abnormal saliva. If we knew enough chemistry to do so, we might be able to approach the question of determining normal saliva, but unfortunately our present knowledge of chemical methods is inefficient, and we cannot get within miles of it, as we might as well acknowledge.

As to saliva solutions and water solutions, I would like to speak of the remarks made by Dr. Hofheinz and Dr. Ferris in that connection. By my experiments made with fruit acids, it has been shown conclusively that the saliva will retard the action of enamel decalcification. In plain words, in a 1:1000 solution of lactic acid saliva, the teeth will in many instances be unharmed, while with a 1:20,000 lactic acid and water solution, the tooth enamel will invariably be harmed. What is the use of saying, then, that we will have better results with the water solutions under those circumstances? It is true that you have fewer difficulties to contend with, but you may say that you would have far less difficulty if you did not experiment at all, and then you would obtain more constant and less contradictory results; but I do not believe that these would be conclusive and they would not indicate the physiological reactions that take place in the mouth. I admit that we are facing an almost unsolvable proposition when we find that a 1:20,000 lactic acid and water solution will attack the teeth—and we have no tests enabling us to recognize that dilution; you may put litmus in such a solution, but you will not have any more effect from the acid solution than you will have from water; and then, when you find that the saliva has a restraining effect of from ten to twenty times that same amount of acid, to omit the saliva tests and to go back to the water tests simply means giving up the whole problem.

Concerning the remarks of Dr. Hofheinz in regard to Miller's experiments,

he evidently had reference to Miller's remarks in his last reports on erosion (Cosmos, 1907). Miller said when somebody asked if he had ever made any tests with saliva solutions, that he had made one test with the saliva solution, and as he remembered, with a one-half to one per cent. lactic acid solution he found that the lactic acid-saliva was so slightly different in its effect from the water solution that it was negligible, and he had therefore continued his experiments with water solutions. I have also found that one per cent. of acid in the saliva has practically the same effect as water, and for that reason I was thrown off the scent for two years in my experiments, having in mind a solution that would dissolve cement, but not enamel. Starting with water solutions of one per cent., then one-half, and so on, until finally I came to 1:20,000 dilution, I found that the last solution would attack enamel more quickly than it would cement, and so I concluded that something was wrong. But when I began to use the saliva tests, I found that these solutions would dissolve the cement before they would the enamel, and that is how I came across the important fact that saliva has an inhibitory action on acid decalcification of the enamel.

With regard to Nasmyth's membrane, I am afraid that that membrane is something that we will have to think over again. That membrane is probably very much like the core of the small boy's apple; there won't be any core. I do not believe that in an ordinary mouth in which the teeth have been brushed with tooth-powders, any Nasmyth's membrane is left when the teeth have reached the age of fifteen years. Nasmyth's membrane is probably found on teeth just freshly erupted, but it is inconceivable to me that on teeth that have been brushed for any length of time and have been used in mastication, and the cusps of which have been ground down in mastication, any Nasmyth's membrane is left.

Dr. Hofheinz. My argument was, To what extent may the organic matrix be affected in the recuperation of the enamel?

Dr. Head. There may be something in the belief in an organic matrix, but in teeth that have been in the mouth for fifteen years it is very questionable how much of the organic matrix is left, and that is to be shown by these experiments.

The remarks of one of the speakers concerning the hardening of steel by the addition of carbon seems a very excellent analogy, and may help in explaining what happens in the teeth. It may be that something is washed out, impairing the strength of the enamel, and this may be restored. I would not say that it is necessarily in the saliva that this should happen, because, while it happens seemingly more readily in the saliva, it also will happen in the open air.

Dr. Wheeler remarked that these teeth were out of the mouth, and in saliva out of the mouth. I know, unfortunately, that it is only too true that we are working on dead teeth, but it seems to me rather hopeful to feel that if the dead enamel has the power of rehardening, it is rather probable that live enamel would at least have the same if not a greater power. While it is true that saliva taken fresh from the mouth every day and kept at body temperature in the incubator is not like the fresh saliva in the mouth, still the fact that this saliva causes such a great difference in the chemical reactions and in the changes that would ordinarily appear on the teeth makes this process valuable, inasmuch as it shows that our water solutions at least are not worth anything at all. This enables us to partially see at least what occurs in the mouth.

I only too readily accept Dr. Talbot's very interesting remark that we must remember that these phenomena occur from or are influenced by body conditions. I am not one who thinks that because the pulp is taken out of a tooth the enamel must be dead. I cannot believe, as long as we have an absolutely clear avenue to the enamel through the lacunæ of the cementum into the interglobular spaces, and through the interglobular spaces into the enamel rods, that of necessity when the pulp is destroyed the enamel is dead. When there has

been any infection and breaking down of the tooth substance, I believe the enamel may be dead—perhaps recognizable by decomposition; but I believe that the tooth, if the pulp has been satisfactorily removed, may be a living tooth with living enamel and should be so respected, and I would like to have anybody show me a scientific reason why the dentin or enamel may not be nourished through the cementum. I think that we should be more careful in saying that the tooth is of necessity cut off from its nourishment when the pulp is removed. If you remove the ovaries from a healthy woman, you make her a hopeless neurasthenic all her life, but if you take diseased ovaries from a woman, you restore her nerves. It is the same way with teeth; if you take the healthy pulp from a tooth, you may take away one important avenue of its nourishment and to that extent impair its strength, but if you remove a pulp that is perhaps infiltrated with septic matter containing large quantities of bacteria, and so inflamed that it will cause peridental irritation, you are doing nothing but good to it. When you destroy a pulp and take it out of a tooth, you naturally undermine the latter's powers of withstanding the blows of mastication, and in cutting it you of course make it more likely to break.

Election of Officers.

The next order of business was the election of officers for the ensuing year, which resulted as follows:

President—Dr. B. C. Nash, New York.
Vice-president—Dr. A. R. Cooke, Syracuse.
Secretary—Dr. Ellison Hillyer, Brooklyn.
Treasurer—Dr. M. D. Jewell, Richfield Springs.
Correspondent—Dr. H. C. Ferris, Brooklyn.

FELLOW.

Matthew H. Cryer, M.D., D.D.S., Philadelphia, Pa.

DENTAL EXAMINERS NOMINATED.

First District—W. C. Deane and S. G. Perry.
Third District—A. M. Wright and J. W. Canaday.
Ninth District—E. G. Parker and H. L. B. Ryder.

EXECUTIVE COUNCIL.

First District—H. L. Wheeler.
Second District—H. P. Gould.
Ninth District—S. Palmer.

PERMANENT MEMBERS.

First District—H. W. Taylor, Hugo Rettich.
Second District—S. Palmer, Wm. Buckley.
Third District—G. B. Young, H. G. Nelson.
Fourth District—C. N. White, W. H. Tibbetts.
Fifth District—C. M. Ryan, G. H. Butler.
Sixth District—G. M. Decker, J. O. McCall.
Seventh District—J. J. Scott, L. H. Gilbert.
Eighth District—A. Hoffman, D. H. Squire.
Ninth District—W. V. Randall, C. J. Turner.

LAW COMMITTEE.

Wm. Carr (chairman), H. C. Croscup, J. W. Canaday, W. E. Snyder, G. A. Potter, M. D. Jewell, F. W. Proseus, F. A. Ballachey, and W. E. Traver.

LEGISLATIVE COMMITTEE.

M. L. Rhein (chairman), F. O. Kraemer, C. E. Allen, E. B. Rhinehart, W. F. Tremain, G. W. Hoysradt, B. S. Hert, H. J. Burkhart, and H. C. McBrair.

Dr. H. J. Burkhart presented the following resolution:

Resolved, That the regents be requested to obtain an opinion from the Attorney-general with reference to the matter of the nomination of a dental examiner from the Ninth Judicial District.

The resolution was adopted.

Motion was made and carried to adjourn until 7.30 P.M.

Friday—*Evening Session.*

The meeting was called to order on Friday, at 7.30 P.M., by the president.

The first order of business was the reading of a paper by Dr. W. L. Fickes, Pittsburg, Pa., entitled "The Chemical and Physical Characteristics of Porcelain and Their Relation to Its Manipulation."

[This paper is printed in full at page 48 of the present issue of the Cosmos.]

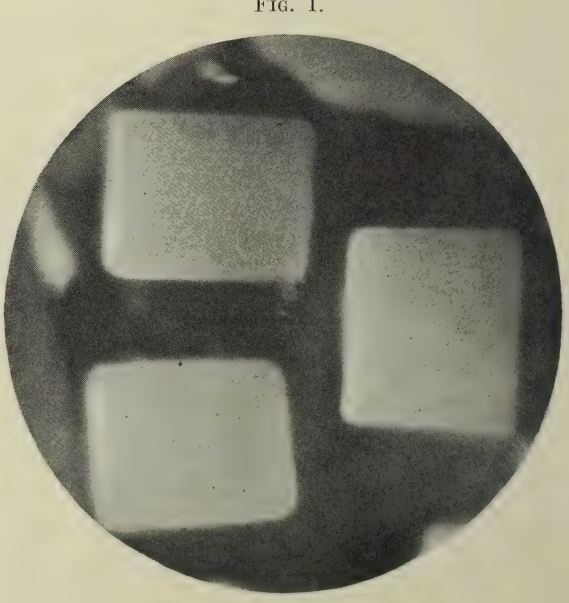
Discussion.

Dr. Joseph Head, Philadelphia, Pa. What would first appeal to the porcelain worker is the interesting fact that porcelain is a chemical composition of itself. Up to this time, I myself had considered it merely a mixture of unfused particles held in a menstruum of particles that had fused at a lower temperature. It is most interesting for us to know that porcelain has something like an exact composition, and that we should as much as possible try to make our work approach a porcelain formula rather than a mere conglomerate mass.

The two points that appealed to me most were those concerning the firing of the porcelain and the use of the pyrometer. Concerning small inlays, or the ordinary inlays which we see, I feel that extreme slowness in the firing is really not necessary, but in regard to crown and bridge work the arguments brought forward in this paper are unquestionably sound, because in a large mass of porcelain, if we have too great a heat, the outside will unquestionably be fused before the inside, and there will be a tendency for the gas to be kept inside, and bubbling will result, naturally producing a weakness throughout the entire structure. Every porcelain worker will admit that if he puts a crown or bridge into the furnace and lets it stay at a heat that will just sweat the porcelain a little, as it were, allowing it to remain until it is thoroughly vitrified, he will certainly obtain much better results than when a heat much greater than the fusing-point of the porcelain is used. The essayist's remarks concerning the pyrometer were especially interesting to me. The pyrometer is supposed to simplify matters so that anybody can put a porcelain piece into the furnace irrespective of its size, watch the heat come up, and, when it has reached a certain point, take the porcelain piece out. As a matter of fact we have to use judgment as to how long we allow the porcelain to stay in the furnace, with or without a pyrometer. So, even with the pyrometer, the judgment after all is left with the operator, not with the instrument, and for that reason I have never particularly cared for the pyrometer. The experienced porcelain worker will be able to tell by looking into the furnace whether the porcelain is fused or not; but if you wish to depend on an instrument, you would need a pyrometer the substance of which will change heat with about the same rapidity as the large or small piece of porcelain, and cool at the same rapidity, but at present no such pyrometer is on the market.

Dr. Charles K. Buell, Buffalo. It has given me great pleasure to listen to a paper so replete with facts and which I must so heartily indorse.

Fig. 1.



There are, however, two or three points upon which I put special emphasis:

First: Proper baking and its effect upon the crushing strength of the porcelain. Here are three cubes (Fig. 1), 0.173 of an inch square, all made from the same mix of porcelain, which was formed in an oblong piece and then cut into cubes before baking. These cubes

FIG. 2.



FIG. 3.



FIG. 4.

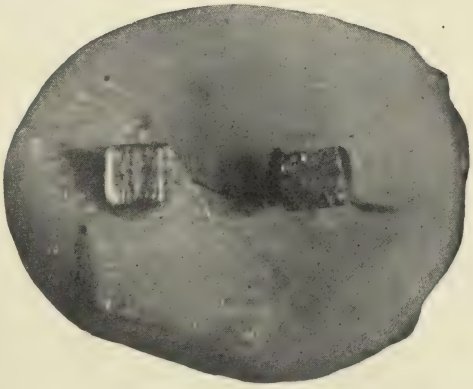


FIG. 5.

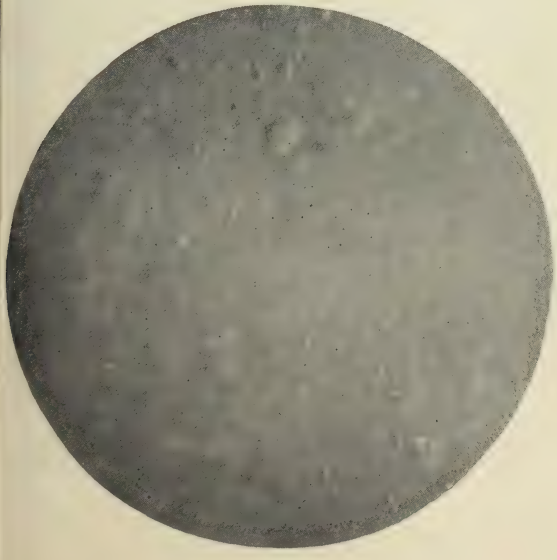
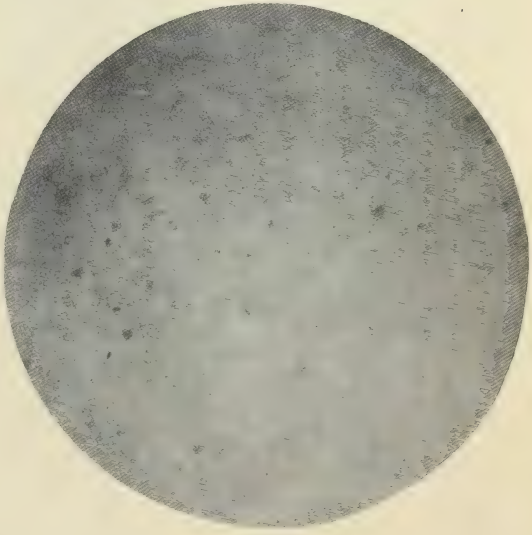


FIG. 6.



represent a biscuit bake, *a*, a final bake, *b*, and an over-bake, *c*. Cube *a* was crushed at 200 lb. pressure. Cube *b* was not affected by 325 lb., which was the maximum pressure of the instrument. Cube *c* was crushed to atoms at 200 lb. pressure.

Second: The control of that troublesome property of porcelain shrinkage, in crown work. How may we make use of our knowledge regarding the contraction of porcelain toward the center of the mass, and toward the point of attachment

Fig. 7.

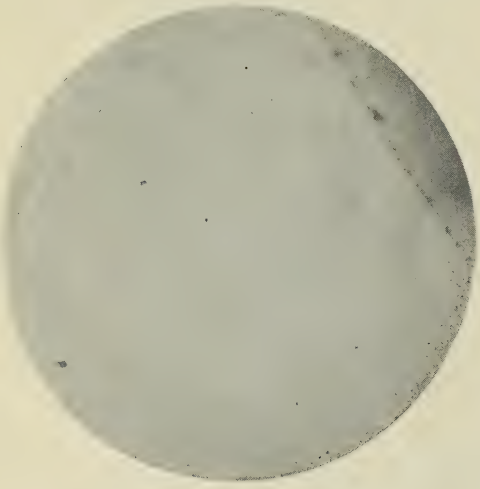


Fig. 8.

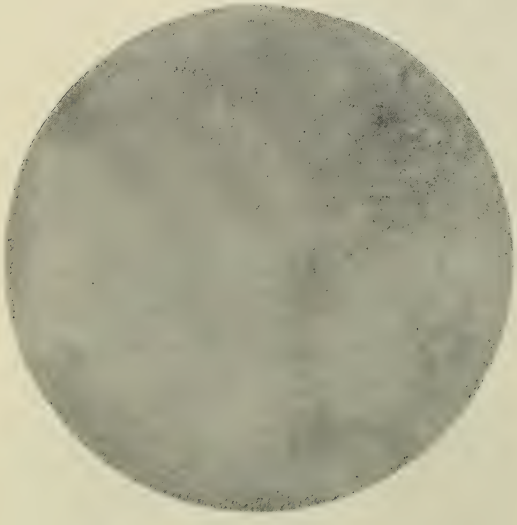


Fig. 9.

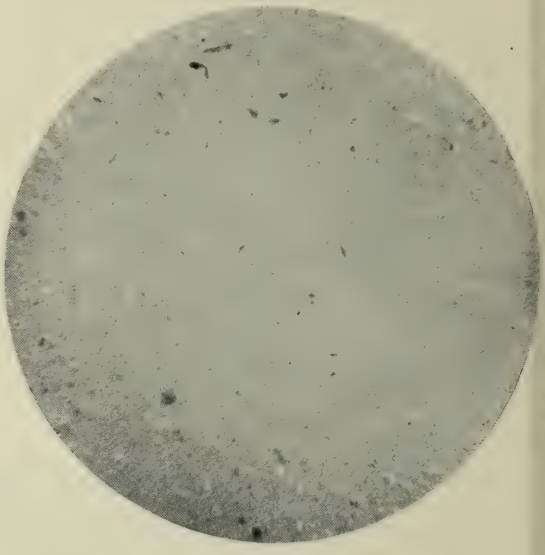
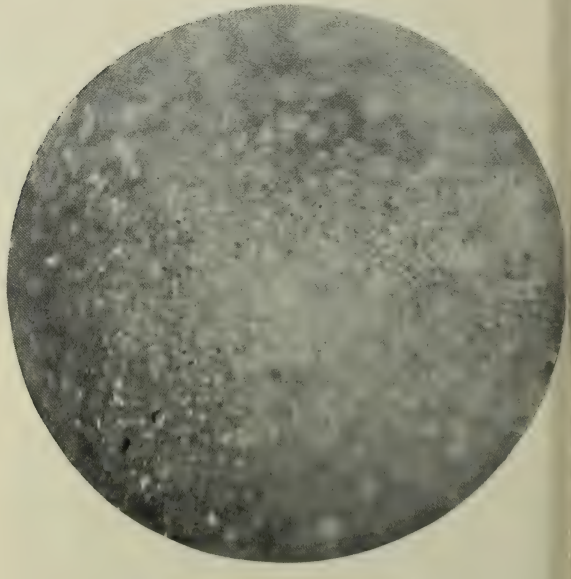


Fig. 10.



in the framework? My slides illustrate the hand-carved crown, in which advantage is taken of both of these properties, in that the only point of attachment is the square post in the center of the mass. This crown consists of a square iridio-platinum post fitted to the root-canal, to which is attached with platinum solder a plate of 0.003 platinum, burnished to fit the surface of the root; this plate is burnished over the periphery of the root, forming a band 1/32 of an inch wide (Fig. 2) to give stability to the platinum during the fusing of the porcelain.

The platinum plate is coated with a thin covering of shellac, and when this is dry the porcelain body is built upon it in layers, in a paper cone, and carved to the desired contour, making use of our knowledge of the amount of shrinkage in bulk, which in the S. S. White high-fusing porcelain is one-sixth.

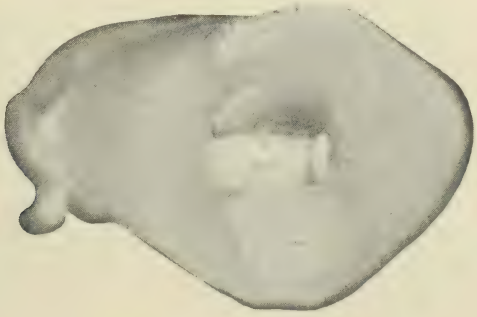
FIG. 11.



FIG. 12.



FIG. 13.

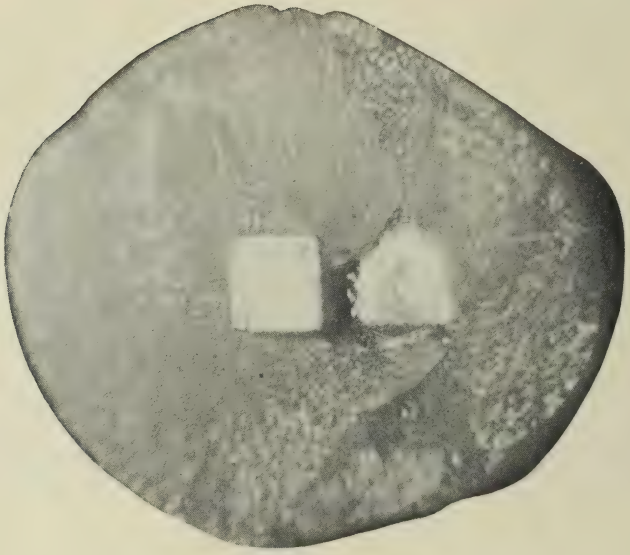


The crown is then biscuited, tried in the mouth, and the platinum is readapted to the root. The space between the plate and the crown is filled in with more of the thin body by carefully jarring it to place, and the crown baked to a glaze. The platinum plate is then detached from the post with a small round bur and re-

moved, leaving the crown as shown in Fig. 3.

cut a fissure in as far as the lingual post, that the attachment may be made to the

Fig. 14.



If two posts are needed, provision for the shrinkage must be made, as there are

other. This fissure is filled in at the subsequent baking. Let us look at the

Fig. 15.

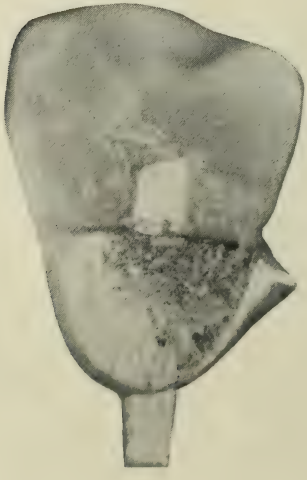


Fig. 16.



two points of attachment, and the porcelain will certainly draw away from one, as shown in Fig. 1. To overcome this,

density of this crown in comparison with manufactured teeth.

Fig. 5 shows the surface highly mag-

nified. Fig. 6 shows the surface of an S. S. White tooth highly magnified. Fig. 7 shows the surface of one of these crowns made of Consolidated high-fusing body. Fig. 8 shows the surface of a Consolidated tooth. Fig. 9 shows the crown broken in order to demonstrate the texture of the interior of the crown. Fig. 10 is a broken S. S. White tooth showing the texture. Fig. 11 is a broken Consolidated hand-carved crown showing the texture. Fig. 12 is a broken Consolidated tooth showing the texture. Figs. 13, 14, and 15 are views of crowns broken open to show the adaptation of the porcelain to the square post. Fig. 16 shows the adaptation to the post of a Logan crown.

FIG. 17.



FIG. 18.

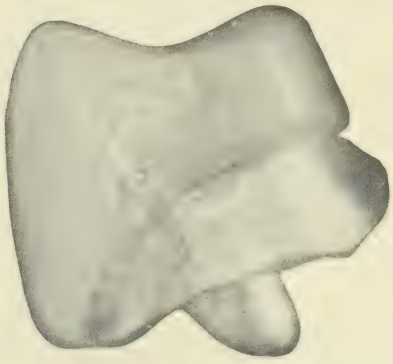
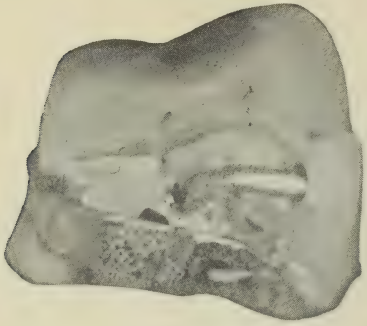


FIG. 19.



Third: Formation of gas due to the chemical reaction during firing at maxi-

Fig. 20.



mum temperature. When a facing is used and the pins are soldered to the post,

Fig. 21.



and the porcelain is added on the lingual side, bubbles around the place of union of the pins and post are most certain to occur. (Figs. 17 and 18.) When an apron is used on the lingual side in conjunction with the facing, and the porcelain is added in three or more bakes, as is usually the case with this class of crown, the result is shown in Figs. 19 and 20. Note the immense bubbles and holes.

Fourth: Fig. 21 illustrates the result of using two porcelain bodies in which the coefficient of expansion varies considerably. Fig. 22 shows how the surface of a crown may be made smoother by ironing with a burnisher before firing.

Dr. Fickes (closing the discussion). I have not much to say, as I agree with almost everything that has been brought up during the discussion.

Dr. Head remarked that the use of the pyrometer is not as necessary in the baking of inlays as in crowns. The bubbles in a small piece are usually not as evident as in large pieces, because they are not so extensive, but if the piece has been overbaked they are just the same, and although the use of the pyrometer may not be necessary, the small piece requires the same care in firing as the large piece.

Perhaps I emphasized the statement

Fig. 22.



that porcelain is a definite chemical compound a little more strongly than is warranted by the evidence in the case. I did that for the purpose of pointing out to the porcelain workers that the so-called porcelains which fuse at low temperatures are nothing more or less than glass, and also that there is a theoretical, ideal porcelain, and that the more nearly we approach that ideal the stronger and more serviceable that porcelain will be.

I want to compliment Dr. Buell on the beautiful slides he has presented. It evidently required a great deal of skill and time to prepare them, and they illustrate almost every phase concerning porosity, coefficient of expansion, etc., which I mentioned in my paper. They further illustrate a number of points which Dr. Buell did not speak of, but he mentioned the most important ones. The greater aggregation of bubbles shown around the metal may be caused by the accumulation of heat in the metal or by an increase in the evolution of gases by the combination of the metal with some substance in the body.

The next order of business was the reading of a paper by Dr. D. H. Squire, Buffalo, N. Y., entitled "The Relative Merits of the Cast and the Malleted Gold Filling."

[This paper is printed in full at page 57 of the present issue of the Cosmos.]

Discussion.

Dr. B. S. Hert, Rochester, N. Y. In the early portion of his paper the essayist refers to a number of subjects which apply to the practice of dentistry in general and to other sciences as well. He rightly approves of the taking of sides when a new method or process is first brought to the attention of the profession.

Those of us who have been in practice a number of years can recall numerous instances of this, among which may be mentioned crown and bridge work, extension for prevention, porcelain inlays, prophylactic treatment, and recently the gold inlay.

To some, new things always appeal at once, and by them they are immediately adopted and many times carried to such an extreme as even the originator did not dare to advocate, nor the process warrant. Through such men a method is sometimes brought into disrepute, either owing to their failure to correctly grasp the idea or because of insufficient time or ability to acquire the requisite skill to properly perform the operation, although the method when properly applied may be all that is claimed by the one who devised it.

There may be some enthusiasts who would fill all cavities, large or small, in which gold is to be used, with an inlay, while others do not use inlays at all; and as usual, neither extreme is wise.

Dr. Squire mentions the following indications to aid us in deciding whether to select the inlay method for filling cavities in the posterior teeth: Invalids with absorption of either the alveolus or soft tissues; frail cavity walls; large restorations, and nervous patients; while for patients of a less sensitive temperament, he advises a malleted filling. The preparation and filling of a large cavity is always unpleasant and usually painful also, even to one who is not of a nervous temperament. If, therefore, the discomfort and suffering resulting from the operation can be mitigated, there is no good reason for not giving every person the benefit of more humane methods. With me the main consideration in deciding whether to place an inlay or a malleted filling is the time that can be saved, to both the patient and the operator, and also the possibility of securely anchoring the filling.

As regards the saving of time, reference is made more especially to the shorter space of time which the patient has to be in the chair; that time can always be very materially lessened, if a cavity is large, by using an inlay rather than a malleted filling. The dentist, himself, if he does all the work in connection with making an inlay, saves very little time, although much of the work is easier; but if he has a good assistant, the time spent on the entire operation will be less with an inlay. In the anterior teeth it is more difficult to obtain secure anchorage for an inlay than it is in the posterior teeth, and if gold is used, the malleted filling is often preferable.

The cavity preparation as described in the essay does not differ greatly from that practiced by me. Extending the buccal and lingual margins to self-cleansing areas is essential, of course. The width of the gingival floor should not, however,

be determined only by the amount of stress to which the filling is to be subjected at the time when it is inserted, but should be extended as far as the proximity of the pulp will permit, for the filling may be later subjected to far more stress than it was at the time when the operation was performed. In such a cavity wall it is usually well to sink a decided groove about midway between the margin and the pulpal wall; this will guide the filling to its correct place and retain it there. The side walls should not be made perpendicular to the gingival wall—for while this may perhaps be the more scientifically correct method, in practice all the walls, axial, lingual, and buccal, should be slightly beveled from the gingival floor of the cavity toward the occlusal surface.

The retention should oftenest be obtained by the occlusal step; usually the step may widen as it recedes from the approximal cavity, and all necessary retention should be obtained in this manner. It is seldom that a groove in the distal end of the step would be of any value whatever.

Making inlays by the impression method has not been satisfactory in my hands; it requires more time, for usually a wax model can be made in the mouth in almost as short a time as an impression and bite can be obtained, and a model made in the cavity is certainly more reliable than one made on a cast taken from an impression—especially so if a hard wax is used.

If the inlay be solid, not hollow, very thinly mixed cement should be painted with a damp brush over the entire surface of the cavity, only sufficient cement being allowed to remain to make a perfect joint, for if the inlay fits well, the smaller the surplus of cement the closer the joint will be.

The tests Dr. Squire made are not arguments against inlays but arguments in their favor, and only prove what experience in the mouth has demonstrated to be true, namely, that inlays will stand all the stress to which they will ordinarily be subjected.

The essayist has devoted considerable space to the malleted filling, while I have said practically nothing in regard to it, because in posterior teeth I have used only inlays for a number of years, except in small cavities. For the malleted filling we can have nothing but admiration and praise, considering its past record for preserving teeth, but if the various steps in making an inlay are correctly made, it will preserve teeth better than the malleted filling would. The inlay is a boon to both the patient and the dentist, and it is my belief that in a very few years the large malleted filling will be a thing of the past.

Dr. R. H. Hofheinz, Rochester. Dr. Squire's paper is written in a fair and most conservative spirit.

It is certainly a vital question for the conservative and conscientious operator to decide when the proper time has arrived for taking up new methods. This is largely a question of individuality and temperament.

Some people always rush into new things, because their nature drives them to constant changes. They frequently fail. The hesitating man is also apt to fail, for he who never risks, never wins.

I do not agree with Dr. Squire when he says that "prejudice and petty jealousy have shut the door of dental progress so tightly," etc. There is no profession which calls attention to its individual achievement any more quickly than dentistry. No profession utilizes new inventions any faster than dentistry. Scarcely two years ago did Dr. Taggart demonstrate his casting process—today we have two hundred different machines on the market. How could so many dental journals exist if it were not for the continuous cry of the "What I have done!"

Dr. Squire tells us that eminent men pray for a pathologic sense, and that to him it seems time to pray for an operative sense. We have had a number of operative senses and periods. No greater gold foil operations can ever be done than have been done by Webb and others. The plastic period had its time of glory, and we are now undergoing an operative metamorphosis which is the consequence of previous perfectings of other methods.

The same law holds good in this case as in evolution. A thing completed must degenerate or change.

What we should always pray for is common sense, the only sense which will permit us to properly discover conditions.

Dr. Ottolengui has long ago settled this question of filling materials when he told us that "There is but one material which is best adapted for the filling of a given cavity at a specified time." This will remain true as long as teeth have to be filled at all.

The cavity formations of which Dr. Squire speaks permit of no discussion; they are based upon well-understood principles, though unfortunately they are not always practical.

There is one class of cavities in bicuspids and molars where I pray for operative sense to decide in favor of filling or inlay, *i.e.* the large approximal bicuspid and molar cavities which extend gingivally.

Take a bicuspid cavity of 5 mm. bucco-lingually near the gingival line. To properly extend such a cavity into a compound cavity for an inlay, it has to be enlarged to at least 6 mm. at the occluso-bucco-lingual angles.

There are times when such procedure seems brutal from the esthetic point of view, and rather than enlarge the cavity in such special cases I use the foil filling, in which instance the cavity at that point need be no larger than between 4 and 5 mm.

Dr. Squire speaks of taking impressions of cavities and working on the amalgam die. Here again we need operative or common sense. In ordinary cases, and especially when the bite is of no great consequence, I should consider this a waste of time.

In extreme cases and when the bite needs much adjustment, I look upon the impression method as the best. The comparative experiments which Dr. Squire has made with cast and with malleted gold under stress are exceedingly interesting.

Let us take up the principal deduction from his experiments, namely, "That pure cast gold yields to a given amount of stress more easily and to a greater degree than malleted gold, except when non-cohesive foil is used in the bottom of the cavity."

This, no doubt, shows that the non-cohesive gold foil filling at the bottom of the cavity possesses the least strength and lowest specific gravity.

I had a mesio-occlusal filling removed from an upper second molar which had been inserted thirty-three years ago, and which had been as perfect a tooth-preserver as anything known to me. It was made of non-cohesive cylinders and finished with cohesive gold. I have eight or ten other proofs of this kind in my own mouth, and any quantity of such in the mouths of patients.

It has become a question in my mind whether the lower density of these fillings has not been the cause of their remarkable preservative power. Every stress exerted upon their surfaces means an expansion of these fillings against the margins of the cavity, and therefore a continuous tendency to additional adaptation.

One important point we must not overlook in such experiments as presented by Dr. Squire. If they are made in the laboratory, it is a question of concentration; the entire pressure is focused on the material. It is a rare case, even in unusually large fillings, that the same amount of stress is brought upon the filling in the mouth; the adjoining tooth-substance usually bears the brunt of it.

This fact, however, does not change the results of Dr. Squire's experiments. There naturally is a minimum of density which a gold filling must have, to withstand the stress of mastication.

If the gold fillings made partly of non-cohesive and partly of cohesive foil have lasted such a great length of time, as we all know they have, cast inlays ought to last at least as long—and longer according to Dr. Squire's experiments—if density enters at all into the question of the relative merits of a filling or an inlay.

It is gratifying to know that a 5 per cent. platinum and gold cast filling yields less than either of the other forms of in-

lays or the malleted gold filling. It would have been interesting to know the difference between a 5 per cent. platinum and gold cast filling and a malleted filling. Dr. Squire can certainly ascertain this before his paper is published. In my estimation, the question of density does not rank with the question of adaptability.

Dr. Squire mentions a few items which will enable the operator to do away with some of the "so-called barbaric practice of the malleted gold filling." Anything can be made barbaric by some people. I defy any operator to completely finish a cast filling in any of the ordinary occlusal or approximal cavities of bicuspids or molars as fast as I and many other operators can complete a malleted filling.

I defy any operator to complete a cast compound gold filling in a bicuspid or molar of 4 mm. gingivo-occlusally to from 3 to 4 mm. bucco-lingually as rapidly as I and many others can put in a good gold filling. Does this detract from the value of a gold inlay? Not a bit.

In summing up, Dr. Squire says, "While its adaptation to the cavity walls is made perfect through the medium of cement," etc. This is partly true. The adaptation to the margin can be made perfect by burnishing the thin overlap of gold upon the beveled enamel, and I believe the question of adaptability is but slightly relative.

If we make what one gentleman has called floating islands, the inlay can only stay by accident or good fortune. I consider the cement of infinitely less importance in the durability of an inlay than its proper mechanical retention.

The fact that cement will retain any inlay for some time leads to dangerous carelessness on the part of some operators. There are many factors in favor of the inlay which, however, need not detract from the intrinsic value of the malleted gold filling: (1) The inlay can be made in sections. There is never any need of tiring a patient. (2) Unusually large cavities, which were formerly filled with amalgam, can readily be restored by gold inlays. (3) The inlay eliminates crown work to a great extent. (4) It is the greatest restorer of proper articulation.

Whether the gold inlay will last as long as the malleted filling is a question that time must decide. Some of the Roman aqueducts have lasted to this very day, yet we are constructing a different kind.

Inlays are in their infancy, but they have nevertheless done an enormous amount of good. Let us hope that time will improve them, as it improves all other things.

I would like to ask Dr. Hert why he claims that the inlay would preserve the teeth better than the malleted filling, while in the sentence before he gives the highest praise to the filling.

Dr. Hert. I said that it deserves the highest praise for what it has accomplished.

Dr. Hofheinz. Do you think you could put in inlays that would last any longer than the gold filling that you replaced in my mouth!

Dr. Hert. I believe that the average inlay will last longer than the average gold filling, and I think there will be less recurrent decay around it.

Dr. F. W. Low, Buffalo. Neither the essayist nor the discussers, to my mind, have given the gold inlay credit for its greatest good, namely, that it falls out whenever conditions are such that it ought no longer to remain. Practically all of us older men, and some not so old, have taken out immense gold and amalgam fillings that have been too well anchored, and we have found underneath them, reaching clear to the pulp-cavity and sometimes including the pulp-chamber, conditions not very desirable, which had resulted from unobservable secondary decay. I therefore think it good that gold inlays fall out under similar circumstances because they have no deep undercuts to keep them in long after they have served their time of usefulness. When a gold inlay does come out, however, it takes only a few moments to remove secondary decay; the inlay may then be slipped back, and if it is found

to still fit perfectly about all the margins, it may be re-cemented. I believe such an inlay to be better the second time, because we have learned something by the first failure, before extensive decay has had time to occur. I am confident that some of my re-cemented floating islands are going to make good fillings for a long time.

Dr. J. O. McCall, Binghamton. In my opinion, it has not been sufficiently emphasized that the relative perfection of the malleted filling and the cast inlay depends to a very large extent on the personal equation. An operator who can put in a good malleted gold filling will probably make a more perfect inlay. It lies therefore with the operator to choose. If he thinks that he can do a better piece of work with the gold inlay, he will accomplish more by putting in an inlay.

Dr. Squire (closing the discussion). On account of the lateness of the hour I will say only a few words

I was impressed with the idea of petty jealousy, etc., spoken of in the paper, from reading the articles that have been written upon the subject of gold fillings since the days of the *News Letter* up to the present time. I found that very many good operators, especially when the crystal gold came into use, would not even look at good gold fillings made with crystal gold. Also when amalgam was introduced, many of these operators would not even take the pains to look at fillings when a patient was brought to their office.

I agree that there have been a few good gold operators, but there are a great many of less ability in this country, and the fillings, the cavity preparation, anchorage, and retention of fillings which one sees would lead one to pray for the operative sense, which Dr. Hofheinz terms common sense, which is really the same thing. I appreciate that the points that I made in the paper should be gone over many times, and I have done so myself a few times since writing the paper, in order to get a correct idea of the truth of these experiments. Dr. Black says that a gold filling should show a specific gravity of at least 15. Now, we also noticed a shrinkage at the end of the occlusal step. I admit that if you have a wide bevel along the cavo-surface angle or margin of the cavity, you would not get such an illumination as I did in some instances where the filling came flush with the walls, but it is a question to my mind whether you should have any more overlap than in the malleted filling.

Dr. Hofheinz. How many times are the photographs magnified?

Dr. Squire. That is hard to tell, Dr. Hofheinz. I made two-inch objectives, and the magnification depends of course on the distance of the object from the screen. I have this work with me, and would be glad to show it if anyone should care to see it. After all, the personal equation enters into this work a great deal. I presume a good many think, owing to the number of holes in the inlays, that I did not take much pains with them, and that I was prejudiced individually against inlays. These inlays were done as well as I could do them and as well as the men who assisted me could do them, and they were made with all possible precaution. The wax cores were examined under a low power of the microscope, and when imperfections in the wax cores were found, the cores were discarded. I personally made from seventy-five to a hundred, and then selected from that number those which I considered the very best. I am not prejudiced against the inlay at all, but I am trying to look at the question with fairmindedness and to be perfectly fair in my deductions.

The next order of business was a paper by Dr. Timothy Leary, Boston, Mass., entitled "Pyorrhea Alveolaris from a Bacterial Standpoint."

[This paper is printed in full at page 52 of the present issue of the Cosmos.]

Discussion.

Dr. E. S. Talbot, Chicago, Ill. I am very glad to be able to take part

in the discussion of this paper written by so able a gentleman as Dr. Leary. The paper is of more practical use than would seem at first thought. It brings a very vital question before us, one which few understand, and for this reason the dental profession has only a vague idea of it. I am glad, therefore, that this subject has been considered a proper one by your committee for discussion before this intelligent body. The paper brings squarely before us both a theory and a condition. The question is, Did the essayist when he prepared his paper on "pyorrhea alveolaris" have in mind simply pus and other infections as a cause, or did he wish to imply that it represented a disease which attacks the gums and alveolar process, resulting in their complete absorption and final loss of the teeth. To the practitioner of dentistry, this means more than is generally considered. The problem is, Does pus or do other infections cause the disease? The actual condition is, that all human beings and animals are afflicted with a disease which commences with the eruption of the deciduous teeth and continues, in a mild or severe form, throughout life, or until the permanent teeth are shed.

To discuss this subject in a scientific manner we would naturally ask ourselves whether the disease, which you and I are called upon to treat many times each day, is due to pus or other infections, or is it due to some other cause?

When Dr. Rehwinkel of Chillicothe, Ohio, applied the term pyorrhea alveolaris to a condition of the alveolar process, he must have had in mind only the pus manifestation of the disease, for his writings do not indicate the pathology of the gum and bone tissue.

The researches by Galippe, Arkövy, Miller, Sudduth, Carpenter, the essayist, and myself fail to demonstrate infection as a cause of interstitial gingivitis. When Galippe announced that he had found a germ which might possibly cause the disease, extensive experiments were made by the different investigators whose names have already been mentioned. My experiments of fifteen years ago are recorded, as are also those of Dr. Carpenter, in my work on "Interstitial Gingivitis, or So-called Pyorrhea Alveolaris." Infections of the gums and alveolar process do occur, but as the essayist says in the paper which he read in Boston before the National Dental Association,* "Bacteriological examination of smears from the pus of pyorrhea furnishes little that is conclusive. Bacteria abound in the discharge, but known pathogenic organisms are marked by their inconstancy."

The mouth is filled with a great variety of germs producing a variety of diseases by infection. I have, in my practice, seen only one case of noma, three cases of Vincent's angina, two cases of gonorrheal infection, and, of course, a number of cases of syphilis. Actinomycosis also affects the gums and alveolar process, but I have never had such a case in my practice. All these infections have characteristic symptoms, none of which present a true picture of the ordinary disease in everyday practice. While syphilis affects the gums and alveolar process by direct infection and is characteristic, yet in most cases the effect on the alveolar process is secondary or tertiary, and will be accounted for in another manner later.

Only a very small percentage of people have pus infection, while, as I have already stated, everyone has interstitial gingivitis. The inflammatory process may and frequently does proceed for many years with absorption of the alveolar process and loss of teeth without infection. The inflammatory condition must always precede pus infection. It is possible that later researches by more modern methods may reveal other infections.

When we consider, then, the small number of infections which are observed in the practice of the dentist as compared with the fact that every patient who applies for the dentist's services is suffering from a disease to a greater or lesser extent, we cannot conclude that infections are the cause of the large majority of cases.

Since all peoples and animals have interstitial gingivitis, a more simple and

* Dental Cosmos, page 55, January 1909.

common cause for this disease must be looked for.

In the treatment of specific diseases, the use of mercury is continued until the gums become inflamed and the teeth become sore; in drug and metal poisoning, the gums are the first to become involved; in scurvy and pregnancy, the gums always become diseased, and the alveolar process is always involved. In all these conditions no one would dare say that the inflammation is due to infection. Observing these pathologic processes, I instituted a series of experiments upon healthy young dogs by the introduction of mercury by way of the mouth, the rectum, injections, and the skin. The dogs were killed at different intervals, and the jaws were prepared in the usual way for microscopic study. Round-celled infiltration was found in the tissues below the gum epithelium, and unmistakable evidence of a mild inflammatory process.

Jaws of persons dying from scurvy and mercurial poisoning were treated in the same manner with like results. It would seem, therefore, that the source of inflammation was an irritation in the course of the arteries rather than an infection.

To understand the nature of this disease, the character of the structures involved must be studied, as there is no similar structure in the human body; therefore no comparisons can be made. The jaws, owing to disuse, are growing shorter, and the teeth are diminished in number. The alveolar process, on account of the shortening of the jaws, disuse, and change in shape of the crowns of the teeth, grows thinner. The blood supply is not so great. The alveolar process may therefore be called a transitory structure.

In some of the lower vertebrates, teeth come and go throughout the entire life. Man has two sets; when one is lost, the second takes its place. The alveolar process is built up twice and is absorbed once. If, however, man should live long enough, he would lose his second set of teeth, which process of absorption is atavistic. The building and absorbing of bone tissue is an inflammatory process, and is constant to a greater or less extent as long as the teeth remain in the jaw. So sensitive is the alveolar process to absorption that after it has developed about the second teeth the process is simply waiting for some irritation to set up a more intense inflammation to produce bone absorption. Again we have a transitory structure, which makes the alveolar process doubly transitory. The alveolar process is an end-organ. The arteries and nerves penetrate the bone in a tortuous manner until they reach the root of the tooth. There they stop. The tooth as far as this disease is concerned might be a foreign body.

With this clinical picture before us, we can readily understand how toxins in the blood—from metal and drug poisoning, from auto-intoxication, including syphilis and faulty metabolism—accumulate in the tortuous bloodvessels in the alveolar process, setting up inflammation and bone absorption. This reasoning, then, led me to coin the term "interstitial gingivitis," since the inflammation is as liable to commence absorption of the alveolar process from irritation in arteries midway or at the apical end of the root as to commence at the gingival margin of gum tissue. Every step in the pathology of this disease, in animals as well as in humans, is illustrated in my work upon "Interstitial Gingivitis, or So-called Pyorrhea Alveolaris." This theory will account for the red line on the gums in mercurial poisoning, the blue line of lead, the green line of copper, and the blue spots occasionally seen of indican. Infections would fail to explain these conditions. Local irritations, then, of both local and constitutional origin, and not infection, produce interstitial gingivitis, absorption of the alveolar process, and exfoliation of the teeth.

In closing, I wish to compliment Peirce, Rhein, Kirk, Briggs, and others who have recognized these principles and have written excellent papers on this subject.

Motion was then made and carried that the meeting adjourn until Saturday morning at 9.30 o'clock.

SATURDAY—*Morning Session.*

The meeting was called to order at 9.30 A.M. Saturday, May 8th, by the president.

The first order of business was the report of the Committee on the President's Address, as follows:

REPORT OF COMMITTEE ON THE PRESIDENT'S ADDRESS.

Gentlemen,—Your Committee on the President's Address beg leave to report that they find much pleasure in commending the enthusiasm and labors of the retiring president in visiting the various district societies in his official capacity. An unusual amount of interest was aroused in the societies visited, and we suggest a continuance of his work along this line by his successors in office.

The remarks of the president with reference to an increase in membership should receive the approval of the society. The arguments presented and the statistics quoted in support of the recommendation are clear and convincing, and evince a most careful and painstaking study of the subject.

The president's reference to the matter of a Dental Hygiene Council merits the serious consideration of the society, and steps should at once be taken looking to the permanent appointment of a council to carry on this most important work.

The recommendation having to do with the inauguration of a new policy in the matter of the conduct of the work of prosecuting violators of the dental laws deserves and should receive most careful consideration. There is much force in the president's observations concerning the past and present status of law matters outside of the metropolitan district, and your committee suggests that the Law Committee be requested to at once take steps to inaugurate a vigorous campaign in all of the districts of the state.

In conclusion, the committee unhesitatingly desires to express its appreciation of the splendid address which they have had the pleasure of considering, and the energy, faithfulness, and courtesy of the president in the discharge of the many duties incumbent upon him as the executive head of this society.

(Signed) H. J. BURKHART,
E. G. LINK,
W. S. ROSE,
Committee.

On motion the report and recommendations were adopted.

Dr. BURKHART moved that the sum of $500, including the sum already voted at the previous session, be transmitted by the treasurer to Dr. Brophy as the subscription of the society to the Miller Memorial Fund.

The motion was carried.

On motion the president-elect was empowered to appoint proper delegates to the National Dental Association meeting and also to the Fifth International Dental Congress at Berlin.

On motion the usual honorarium of $150 to the secretary and $75 to the treasurer were ordered drawn upon the treasury.

The Executive Council then presented its report.

On motion the report was adopted.

The president-elect, Dr. B. C. Nash, was then conducted to the chair, and was installed by the retiring president in a few well-chosen remarks.

Motion was then made and carried to adjourn until the next annual session.

The remainder of the day was devoted to clinics.

SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA.

Forty-sixth Annual Meeting, Harvey's Lake, Pa., May 18-20, 1909.

(Continued from vol. li, page 1447.)

THE next order of business was the reading of a paper by Dr. EDWARD C. KIRK, Philadelphia, Pa., entitled "The Question of Medical Education for the Dentist."

[This paper is printed in full at page 34 of the present issue of the COSMOS.]

Discussion.

Dr. H. C. FERRIS, Brooklyn, N. Y. I agree most heartily with the whole substance of Dr. Kirk's paper. The older I grow and learn how little I know, the more I regret that I have not had a better foundation for my dental education to fit me for advanced dental work. It has been my aim and my privilege to carry a chip on my shoulder for every medical man I meet. In order to do so, I have tried to make myself scientifically as good a dentist as I possibly could by hard work and application to study, and when I am introduced to a medical man, I immediately say "D.D.S." The face of the medical man usually goes through a few contortions and he generally addresses his conversation to the M.D. who stands alongside of him. A sense of regret is therefore constantly with me, although we are a distinct profession—a branch of the healing art—and the plan of our education has made us what we are. This question that is arising at the present time is one symptom of the fact that the medical fraternity is becoming more and more interested in us, and that they are investigating our personal qualifications to undertake operations that they feel incompetent to make in their hospital work and everyday practice. If the dental degree could be increased in its value from the biological standpoint or the standpoint of a preliminary education, our specialty would be of greater benefit to mankind. I believe there is plenty of room for improvement in the requirements for education, and we may some day see it an accomplished fact that in the colleges connected with universities the dental course will be simply an extension of the university course, and, if I read the times aright, this subject is prominent in the mind of the Faculties Association at the present time. In the near future the dentist will be a better chemist and bacteriologist, and be able to cope with problems which confront us every day. I wish that this might occur soon. In some of the faculties such an effort is being made at the present time, at the expense of the number of students in the classes. In institutions which are dependent upon the income that they receive from their students, and which have had no or comparatively little endowment, this has been a serious problem, and is one of the greatest drawbacks at the present time, but the time will come, and I believe soon, when such institutions will receive donations and endowments from those of our calling who are interested in our improvement. Our colleges will soon require a more complete education in the anatomy and physiology of those parts upon which we are working.

Dr. H. S. SEIP, Allentown. From Dr. Kirk's remarks in regard to the D.D.S. degree being a badge of partial culture, it logically follows that the same applies to the M.D. degree. In other words, the M.D. degree would be placed on a par with any of the other preparatory de-

grees that are required as a general culture degree, such as the A.B. or the B.S. degree; then would follow your work of specialization, and dentistry being a specialty of medicine, the D.D.S. degree would logically follow the M.D. degree. If, according to the remarks that Dr. Kirk made in reference to Dr. Talbot and others who argue in favor of the M.D. degree, the medical profession regard themselves as perfection, they are very much mistaken, because at this present day there is an ideal educational movement on foot throughout this whole country—one man in Tennessee is devoting his entire life to it—to elevate the medical profession to that ideal which will place it on a higher basis. It is to be regretted that the dental profession has not also some man doing this.

Dr. P. B. McCULLOUGH, Philadelphia. Fifteen years ago the Academy of Stomatology had a rule that each member of the society had to produce something for the society within two years. I had just been introduced into the society when I discovered this, and was sorry that I had joined, but I felt that there was no escape for me; so I prepared an essay on this subject. I wanted to see what other men thought about it, and I went over twenty years of back numbers of four or five journals, and collected so much data that I did not know where to begin to write my paper. Fortunately, before I finished the paper the Academy changed its rule, owing to increase in membership, and I escaped. I was convinced at that time from the data which I had collected and from my own observation that dentistry was a specialty of medicine. The mouth being an important part of the body, and a knowledge of the whole body being required for a proper knowledge of the science dealing with any part of the body, dentistry is a specialty of medicine.

I agree with Dr. Talbot unqualifiedly that we are tooth-carpenters, and I think the few remarks which I made in the discussion of my own paper went toward proving that. It is a disgraceful state of affairs that we have not a definite standard for anything. None of the text-books describe any operation with any degree of scientific precision. No two men will perform the same operation fairly alike. That is what makes tooth-carpenters of us. We must not lose sight of the fact that we do not have any method that is followed with any degree of scientific precision, and just as soon as we have such methods shall we cease to be tooth-carpenters, and become scientific dentists.

Dr. KIRK (closing the discussion). I am very much pleased, Mr. President and gentlemen, that what I have had to say has not given rise to any misconception. I always attack a problem of this sort with hesitation, because I find that after the thing is all over and when I have attempted to say something about it, somebody has gone away with a misconception of my meaning. I do not want anyone to have any misconception of the esteem and veneration in which I hold the medical profession; for I have said in my paper, after very considerable thought, that the medical man who conscientiously practices his profession and endeavors to live up to the higher ideals of medicine is second to no other individual in the social community. I raised a discussion of this point before I left Philadelphia with a man who is a careful thinker on such things, and he said, "What about the law as a learned profession?" I said, "I will answer that question by asking this: Which do you regard as more important, your property or your life?" I tell you the physician who has the true ideal stands in a relation to you and me which no other human being has the right to fill. No man who ministers to the affairs of men takes a second place in my admiration, respect, and veneration to that of the physician, but what I do object to is the hypocrisy of the man who practices dentistry, earns his living in dentistry, yet is ashamed of his calling and wants to be something else. I believe in taking the medical degree. I believe in medical education for the dentist, as much as he can take for the good of his dentistry—in anything and all things that will make better dentists of us; but as a

practical matter of education I believe it is wrong to put the student through the medical curriculum which leads to the medical degree and then attempt to make a dentist of him afterward. There is much that the dentist does not need of medical education. Even dentistry has become so broad in scope that it requires all sorts and conditions of mind to compass it. One man's mind cannot do it—cannot take in everything in all departments.

As bearing on the remarks of Dr. McCullough, Dr. Black once said to me when discussing questions of research in dentistry, "Dr. Kirk, we have just scratched the surface of things; we have not gotten below the surface; we are just beginning." I do not want any misconception as to my ideals in regard to the education of the dentist. I want him educated fully, and I want him to have the basis of a sound medical education, but I want him to get it with the dental ideal as its end, and not the medical. I do not want to create practitioners of dentistry who think that they can sit in offices and write prescriptions for filling teeth and have them filled by someone else, for the dentist must execute as well as know.

With regard to the question of education of the dentist on medical lines, and in reference to what Dr. Seip has said as to the logical position of the medical degree, I think that the medical profession should squarely face this issue, meet it fairly and honestly, and by that I mean that certain branches of the medical curriculum should be recognized as fundamental branches, and that they should be required as the foundation of education for any man who proposes to concern himself with any department of the great art and science of healing—that the teaching of these fundamentals should be made uniform for everyone. We must have the foundation based on a knowledge of the human body. We need anatomy, with all its subdivisions, gross and minute anatomy, physiology, physiological chemistry, and pathology with its subdivisions. These things every man should know who intends to practice any department of the art and science of healing, and my feeling is that there should be a division in the educational course at the point where training in these fundamental essentials is completed—that it should be marked by some sign or degree equivalent to the bachelor degree at that point, after which should come the special course of study leading up to the department which the student has elected to practice. If there could be such a reorganization of medical teaching then dentistry would be in its proper place.

Another feature of this is that I am, as a teacher, in the practical work of manufacturing dentists, endeavoring to create out of certain raw materials a certain percentage of finished practitioners, and I want to tell you that at present we have to take the products of all kinds of preparatory education; but what we want most is not so much of quantity as quality in our preparatory school work, and if there is anything that you can do in your community politically —because unfortunately it has to be done mainly through political influences—if you can do anything to secure better teachers, by paying better salaries, to secure a better training of these young prospective dental students in their preparatory stages, it will be a benefit to the profession. These are the raw materials that we have to make dentists out of, and I can tell you that in the University of Pennsylvania fully forty per cent.—it runs between thirty and forty per cent. —of the raw material that we take in, coming to us with a certificate of a four-year high-school education or its equivalent, drop by the wayside during the dental course as unfit to take the dental degree. It is a wasteful manufacturing industry when forty per cent. of the raw material is only fit for the scrap-heap. Therefore I ask you men who have influence in your communities to interest yourselves in the matter of preparatory education, beginning even at the kindergarten, and do what you can to stop this wasteful practice of putting men through who are unfit for the practice of dentistry. Men come to us with high-

school certificates and do not know how to spell urine; they will spell it eurin. We find men who do not even know the simple rules of arithmetic. The whole system of memorizing as practiced in the schools is the main cause of the trouble. It is not the fault of the pupils, it is the fault of the wasteful methods of American education. The boys who come to us as the product of the American public schools do not compare favorably, anything like favorably, with the men who come as the products of the French and German preparatory school system. We need a reorganization of the whole preparatory educational system.

Dr. Spencer moved that the society extend to Dr. Kirk a rising vote of thanks for his paper. The motion was carried.

Dr. Thomas moved that a vote of thanks be extended to the proprietor of the hotel, to the essayists, to the clinicians, to the exhibitors, to the visitors, and to all who had taken part in the meeting.

The motion was carried.

The Board of Censors reported a number of applications for membership, and on motion the list of applicants was received by unanimous vote.

The Secretary presented a bill from the financial secretary for $12.50, which on motion was ordered paid.

Motion was made and carried that the selection of the next place of meeting be left with the Executive Committee.

The next order of business was the report of the Committee on the President's Address, by Dr. Van Horn, chairman, as follows:

Report of Committee on President's Address.

In recommending the President's address to the society we would say that the most important consideration at the present time in suppressing illegal practitioners consists in the education of the people to such a status that they would appreciate proper dental service.

We would also recommend the adoption, in addition to this report, of an indorsement of the journal to be issued by the National Dental Association. Otherwise, we think that the report is complete and comprehensive.

C. S. Van Horn, *Chairman*,
W. E. Davis,
Geo. Luxemburger,
Committee.

Motion was made and carried that the report be accepted and placed on file.

The next order of business was the report of the treasurer, Dr. Walker, which on motion was accepted and referred to the Auditing Committee. The committee subsequently reported that they had found the treasurer's books correct.

Motion made and carried that the treasurer's report be adopted.

The Committee on Revision of By-laws, through Dr. Van Horn, reported as follows:

Report of Committee on Revision of By-laws.

Your committee has realized the importance of a revision of the by-laws, but in consideration of the fact that the State Society is intending to reorganize, we recommend that the revision of the by-laws of the Susquehanna Dental Association be deferred until such time as we can determine positively what is most important. We would therefore recommend the appointment of a committee of three to take action on that, and have this as a standing commmittee, if necessary.

Motion was made and carried that the report be accepted.

There being no further business before the society, motion was made and carried to adjourn until the next annual meeting.

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EDWARD C. KIRK, D.D.S., Sc.D.

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PHILADELPHIA, JANUARY 1910.

EDITORIAL DEPARTMENT.

DENTISTRY AND THE PUBLIC SERVICE.

EVERYONE who has kept in touch with the present awakening of interest with regard to the public service relations of dentistry must have been impressed with its widespread extent. Dental societies and individual practitioners throughout the country have become alive to the great importance of this phase of dental activity and the interest in the subject which is rapidly becoming expressed in terms of action. Never before in the history of the dental profession has there been such a general awakening to an appreciation of the importance of the mission which dentistry can perform and ought to perform in a humanitarian way for the public health. Heretofore we have been content to minister principally to that portion of the community that was able to pay a fee for the service rendered, and upon the basis of the results attained in the rendering of this compensated service we have based almost wholly our claims for professional recognition and for recognition by the public as practitioners of a humane

calling. By the inspiration of a few who have been blessed with a larger range of vision, and who by precept and example have shown that there is a still larger professional duty before us, there has come about a general appreciation of the fact that the way to a higher and broader professional life is to be found not in the exclusive doing of work for which we are financially compensated, but in an unselfish service to that larger and worthy element of humanity that is unable to pay for the service rendered.

It is interesting to note that the present interest in public dental service is by no means confined to dental professional circles. For some time past there has been a growing interest in medical circles regarding this same problem. As dentists we have for years been preaching the importance of mouth hygiene, the relations of the buccal cavity to general health conditions, and the importance of certain dental and oral diseases in their constitutional bearings as well as the diagnostic value of mouth lesions as related to systemic states. We have proclaimed the fact that the mouth and its contained organs is a part of the bodily economy, with which it is in such sympathetic relationship by its vascular and nervous connections that aberration from normal health in the one is almost certain to produce its reflex effect in the other. As a result of the emphasis which we have publicly given to this view of our field of work our medical *confrères*, in connection with their own studies of the question, have come to accept the general accuracy of the position here referred to. The demand is therefore being heard from the medical side as well as from the dental side, that provision be made for the extension of the benefits of dental service to that class of the community who are unable to pay for it.

A similar demand is coming from public health departments in many of our larger municipalities, and a still larger and more important demand is coming from educational boards who have to deal with the physical factor in the educational work of our public school system. It is being generally recognized by the public school authorities of the land that defective dental and oral conditions in school children are a fruitful source of mental backwardness due to the mental inefficiency of those who suffer from this source of physical disability. The proportion of school children who are below the average grade and who are repeating

courses of study is so great as to involve an addition of $27,000,000 annually to the taxpayers' burden, which it is believed would be materially lessened if the element of mental inefficiency due to preventable dental defects were eliminated by effective dental service in connection with our public school system.

The need for similar service in connection with public institutions for the care of the needy and defective of all classes, the insane, the incurable, the inmates of prisons and reformatories, is equally important. So likewise is the need in the case of those enlisted in the defensive service of the country. Our soldiers and sailors, viewed simply as fighting machines, cannot be maintained upon the highest basis of physical efficiency unless their masticating mechanism is kept in the normal order of serviceableness.

These in general represent the several directions from which comes the demand for an enlarged interpretation of the public service relations of dentistry and which are pointedly raising the inquiry as to how the demand shall be met.

In times past the criticism has been made by the medical profession, and not without justification, that dentists, generally speaking, were not willing to give a portion of their time and skill to the public service without financial compensation, as is customary in the case of medical practitioners; and that until a broader and more unselfish spirit in this particular was practically manifested by dentists, they would as a matter of fact fall some points short of that professional stature which they had claimed for themselves. We believe that the principle involved in this critical expression is correct, and that the time has arrived to refute it by entering into the field of work that is now opening up before us. That it has not been done before is due to a variety of circumstances. It is not true that our failure to actively engage in this field of work has been due to any widespread spirit of selfishness, but rather to the fact that it has required many years of active educational effort by the dental profession to direct medical attention as well as the attention of the public to the vital importance of the work which the dental profession as such was doing. That recognition has now come; the psychological moment is here, and with it comes the demand that we shall practically demonstrate the truth of our contention that dental service is a vital need in relation to public health.

The manner as well as the spirit in which the response to this demand shall be made by the dental profession is a critical and important factor of the situation. Already there are evidences of a tendency to commercialize the fundamental spirit of philanthropy which should be the sole and sufficient motive back of the work. If the manufacturer of or dealer in dental supplies is to be annexed to this movement—even to the extent of promoting it under the specious guise of conducting an educational campaign in favor of dental public service, but really with the object of creating a larger market for his goods—it will not only result in failure to attain the object, but will strike a fatal blow at dental professional life from which it cannot recover. That this tendency is already manifesting itself, and for the avowed purpose of increasing the dental supply business, is matter of record and should be generally known and recognized. Nor is this commercializing tendency in relation to public dental service confined to mercantile and manufacturing sources; already within the dental profession there are symptoms of an effort to utilize the opportunity created by the present interest in public dental service for commercializing the spirit or principle back of it, by attaching to it a financial inducement upon a stockjobbing basis. All such efforts are inimical to dental professional spirit and subversive of the best interests of the dental profession, and should be treated as such. To make the movement successful it must be promoted unselfishly; we must go before the court of public opinion with clean hands and pure hearts, animated only by a love of our profession and a spirit of true philanthropy, if we are to hope to win our case.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Geo. Poulson's Bericht ueber Neuheiten und Praktische Erfindungen auf dem Gebiete der Zahnheilkunde und Zahntechnik*, Hamburg, October 1909.]

PRACTICAL HINTS FOR THE MAKING OF GOLD AND OTHER DENTURES. By G. Bendixen.

For the swaging of gold plates, dies of Spence metal are most to be recommended, because they do not influence the gold in any way, while tin, zinc, and lead always leave small particles on the plates; therefore, unless the plates are cleaned most thoroughly after each swaging, they may be spoiled in annealing by the adherent metal particles. As Spence metal dies are not very stout, the general shape of the plate is obtained on a preliminary die, the more minute contours and details of the plate to be secured by use of the Spence metal die and a horn mallet. The preliminary bending of plates by the aid of flat or round tweezers is not to be recommended; it disfigures the metal and may produce weak spots that later on may lead to fractures. The preliminary die also renders the use of expensive swaging presses unnecessary. Before preparing a gold plate on the preliminary die, it should be thoroughly annealed. Very soft gold is preferable anyway. Gold plate of a sixteen or lower karat must be annealed and allowed to cool in the air. Higher karat gold can be cooled in alcohol. Pure soft gold does not tear in hammering. If small folds form at the edge, they should be removed by swaging on the preliminary die. If in swaging the plate on the preliminary die the palatal arch has become too high, it can be bent back by hand force to generally fit the Spence metal die. After the plate has been thus prepared, it is laid between the Spence metal die and counter-die, and may be pressed with a hand press. After the first pressing the excess of gold is cut off with metal shears. The more delicate contours are best sawed out with a fine metal saw. In cutting and sawing a fine edge is always formed. This should be carefully scraped with a three-edged scraper, as it may otherwise injure the dies. After some practice very satisfactory results may be obtained by this method.

[*L'Odontologie*, Paris, November 15, 1909.]

FORMALDEHYD AND TRICRESOL IN DENTAL THERAPEUTICS. By Dr. A. Audy and Dr. C. André, Paris.

For the sterilization of root-canals, especially very narrow ones, the authors suggest the following formula:

Gaseous formaldehyd,	40 grams.
Essence of geranium,	20 "
Tricresol,	20 "
Alcohol, 90 per cent.,	20 "
	100 "

Essence of geranium is chosen on account of its remarkable antiseptic power, its chemical stability, and the non-irritating quality of its vapors. The tension caused by the chemical reaction of the geranium vapors is somewhat released by the tricresol vapor, which has an action similar in this respect to that of phenic acid.

In cases of caries of the fourth degree the pulp-chamber is opened, a cotton fiber saturated with chloroform is laid over the orifices of the canals for two minutes and removed, the cavity is desiccated, and a cotton fiber saturated in the above solution is laid over each root-canal and sealed in with gutta-percha. This fiber is renewed after one or two days, and all the pulp débris that has dried up is removed. At the third sitting it is generally possible to remove all remaining débris, to thoroughly clean the canals, and to introduce a soft paste of zinc oxid, iodoform, or aristol, and the mixture above suggested, after which the tooth is ready for filling.

The advantages of this formaldehyd-geranium-tricresol mixture are the following:

(1) Time is saved because each of the combined antiseptic and microbicidal agents acts differently on the microbic colonies and their toxins.

(2) The cavity can be sealed with gutta-percha at the first sitting without subsequent complications, such as periodontitis, congestion, etc.

(3) The remarkable dehydrating effect of this mixture.

(4) Besides the disinfecting and healing action of the formaldehyd, the essence of geranium has a strongly dissolving and mummifying action, dissolving the fatty acids due to the decomposition of the albuminous substances, and mummifying the tissues and débris which have escaped in the mechanical cleaning process.

[*Journal of the American Medical Association*, Chicago, September 11, 1909.]

THE SURGICAL TREATMENT OF CERTAIN DEFORMITIES OF THE JAW ASSOCIATED WITH MALOCCLUSION OF THE TEETH. By Dr. W. Wayne Babcock.

In considering the operative treatment of a deformity of the jaws, one should not limit himself to the consideration of a single operation, but should, until further advances have been made, consider the following possibilities:

(1) By surgical measures it is possible (*a*) to change the relation between the body of the lower jaw and the rami so as to produce protrusion, recession, tilting, or lateral displacement of the body of the jaw upon the ramus; (*b*) to change the shape of the arch of the jaw, either increasing or decreasing the size of the arch or altering its form; (*c*) to change the relative position of an anterior section of the jaw as related with a posterior section of the body and ramus; (*d*) to transplant and change the position of segments of the alveolus with the teeth which it contains, the arch of the jaw not being completely devided, and nutrition being maintained by the preservation of attachments to the soft tissues.

(2) When it is found by a study of models in a particular case that a correction of the deformity and a fair occlusion may be obtained without dividing the dental arch, the preferred operation is the section of one or both rami along the lines found to be best adapted to the particular case. This operation is useful for many cases of prognathism, receding chin, and certain lateral deviations of the jaw. In certain instances, as in hypoplasia, it may be necessary to combine it with other operations designed to increase the size of the arch.

(3) Where it is desired to enlarge the dental arch, a vertical section of the alveolus is carried two-thirds of the way through the jaw, the line section is then carried at right angles for a variable distance, and the remaining third of the jaw divided parallel to, but in a different plane from the first vertical section. The arch is then to be opened by sliding the segments of the jaw on each other, and fixation in the proper position secured by adjusting an appropriate interdental splint or other appliance which previously has been prepared. By doing this operation on the anterior part of the jaw the arch may be widened, and if placed laterally, one or both sides of the arch may be lengthened. With a resection of the divided bone ends, this operation may likewise be used to reduce the arch at any point, or the arch may be reduced by a simple resection of a V-shaped or wedge-shaped section of bone, as may be found desirable.

(4) To change the plane of occlusion of only a segment of the jaw, a bilateral V-shaped or wedge-shaped resection after the method of Angle may be used, or an osteoplastic section.

(5) Somewhat similar operations are to a less degree available for the deformities of the upper jaw. Kocher has shown that a transverse supra-alveolar resection on the maxilla is feasible, and as this operation may be used to mobilize one-half or the entire dental arch, it is obvious that it will render possible decided changes in position for the correction of deformity. The separation of the maxilla in the mid-line or a plastic displacement of a portion of the alveolus with the contained teeth is likewise feasible. Unfortunately most of these operations are more difficult and attended with more serious hemorrhage and other complications than the operations on the lower jaw. The fixation of the mobilized portions of jaw after these operations, however, involves less difficulty than in the case of the mandible.

The above operations are briefly mentioned to indicate the surgical procedures which may be employed for the correction of deformities when the less serious orthodontic measures are unavailing, and to stimulate the development of this surgical field.

[*Oesterr.-Ungarische Vierteljahrsschrift fuer Zahnheilkunde*, Vienna, April, and July 1909.]

INVESTIGATIONS ON THE APPLICABILITY OF CELLULOID IN DENTAL TECHNICS. By H. Avellan, Univ. Helsingfors, Finland.

It requires some courage to take up the subject of celluloid, which has fallen into general disrepute among dentists. The author's investigations as presented in this lengthy treatise are, however, none the less commendable, as he bases his conclusions on painstaking experiments, which present celluloid in its proper sphere of applicability.

The variability of prosthetic pieces made of celluloid is due to contraction owing to its being pressed at too low a temperature. Under normal conditions, a prosthetic piece of celluloid does not contract if it has been pressed for not more than ten minutes at + 105° C. If kept at a heat of + 70° it will spoil, also at + 100° kept up for more than five seconds. At + 105° it becomes sufficiently plastic; at a greater heat, however, it becomes porous, as, for instance, at + 110° within 20 minutes. This porosity is largely the cause of the wearing out of celluloid dentures and their bad odor. It can, however, be applied with good success in regulating, immobilizing in pyorrhea alveolaris, in nose and ear prosthesis, in fractures, and in combination with other materials in dentures. Rings made of acetone and celluloid in mixture contract from 20 to 25 per cent. if they are held in boiling water for a few seconds. The contraction of rolled celluloid is so great that this source of energy can be applied in regulating. In measuring roots celluloid may be used instead of other materials. The failures with celluloid, which have been attributed to the whimsicalness of the material, have been due to a lack of knowledge of its properties and the degree of heat at which it must be manipulated.

[*Proceedings of the Royal Society of Medicine*, London, July 1909.]

A NEW INTERDENTAL SPLINT. By Dr. J. Lewin Payne.

The two considerations which most concern the dental surgeon in the treatment of fractures of the jaw or in cases of retention of the mandible after operation, are the relationship of the fragments to their normal position and the cleanliness of the mouth. The first point has a bearing on the second, for as long as the fragments remain unstable it is difficult to keep the mouth clean, and undue mobility promotes suppuration. In any case the tendency to sepsis is considerable. This may be attributed (1) to the fact that there is usually direct communication between the injured bone and the cavity of the mouth; (2) to the difficulty of retaining the fragments in position; (3) to the form of the splint commonly employed, and (4) it may well be added that the type of patient in whom fracture of the jaw most commonly occurs rarely understands the elements of the hygiene of the mouth, or, if he understands them, fails to practice them.

The cradle splint, designed by the author, is only suitable in cases in which there are several teeth present; there should be no fewer than four or five in each jaw, and their implantation should be firm. The method of constructing this splint is as follows: When the impressions of the upper and lower jaw have been obtained and cast in plaster of Paris, the model of the fractured jaw is sawn apart if it shows displacement of the fragments, articulated with the opposing model, and then reunited in the usual way. Metal dies of both the upper and lower model are next made, and a silver-wire framework is fitted to each of them close to the necks of the teeth on the lingual and labial aspects, also as far around the arch as it is convenient to carry the splint. A very tightly fitting cradle is neither necessary nor desirable. This is perhaps fortunate, since, as is well known, in many if not in most cases it is difficult to secure entirely accurate impressions, owing to the conditions which prevail. Silver wire, gage No. 4 or 5, is used; it is sufficiently soft to be bent with pliers when the splint is being adjusted to the mouth, and yet strong enough to hold the fragments firmly in position when the cradle is completed. The ends of each half of the framework are soldered together, and at this point they resemble a pair of Hammond wire splints which fit the teeth of the upper and lower jaw. The next step is to strengthen the arches by soldering bars to them at suitable intervals; these

bars unite the labial and lingual sides. It is convenient to have two or three such bars in each arch; they can be placed at intervals between the cusps of the teeth, or in the spaces left by extracted teeth. These bars not only help to strengthen the splint, but they also give it a firm grip and prevent it from slipping on to the gum. The plaster models are then mounted in the position of correct occlusion on a Gritman or other anatomical articulator, and when the two wire arches have been adjusted to them, the bite is raised about ¼ in., or to such a height as will conveniently allow of the introduction of food when they are in position, but not so high as to interfere with the insertion of the splint. The two arches are then united by vertical rods of silver wire, two or three of which are soldered on the labial and lingual sides. This done, the cradle is complete, and after it has been trimmed up, polished and gilded, it is ready for insertion. The cradle is gilded in order to prevent the discoloration which otherwise occurs when a silver appliance is worn in the mouth.

In fractures of the jaw where the displacement is small and the muscular pull is not strong, the splint will keep the fragments well together without aid, but in most cases it is better to attach it firmly to the teeth by means of wire ligatures wound around in figure-of-eight fashion, as employed for Hammond's splint. Three or four ligatures applied to each jaw will usually hold the parts in good apposition. The advantages claimed for this cradle splint are these: The teeth are retained in their normal position of occlusion, so that even if the fracture lies behind the last tooth, the cradle is still available; it grips displaced fragments firmly and retains them in position; it is clean in itself; it does not prevent the cleaning of the teeth while it is in use; the condition of the jaw and the progress which is being made can be observed without interfering with the splint. Finally, the cradle splint may also be applied in cases in which, either owing to a malignant growth or some other serious cause, a section of the mandible has been removed. The insertion of the cradle splint a day or so after this operation not only controls the tendency to deformity, but it also hastens the healing of the wound, and the patient finds it a source of considerable comfort.

[*Deutsche Monatsschrift fuer Zahnheilkunde*, Berlin, October 1909.]

INVESTIGATIONS ON THE ANATOMIC CONDITIONS FOR THE PROCESSES OF METABOLISM AND SENSIBILITY IN HARD TOOTH SUBSTANCES. By Dr. M. Morgenstern.

Of these investigations, which represent part of the life-work of this eminent scientist, and which were jotted down on his deathbed, we reproduce the clinical portion in abstract, the bulk of the paper being somewhat distorted by omissions.

Burring into normal enamel becomes painful when the bur reaches a certain depth of the enamel before touching the dentin. This pain increases the more closely the bur approaches the dentinal border, reaches its maximum intensity at that border, and diminishes the farther the bur enters into the dentin. This pain persists at its maximum intensity as long as the bur moves closely to the dentinal border, that is, parallel to the surface of the dentinal layer. Outwardly intact teeth, upon being brought into contact with cold or sweet substances, even for a short time, may immediately undergo severe pain, especially the intact teeth of older people, also those of young anemic or convalescent persons. If the very thin enamel at the neck of the tooth is denuded of gingival tissue, the same phenomena of pain may be observed even upon the mere touch of a finger. If in such places erosion, though ever so slight, takes place owing to mechanical causes, neuralgias of daily or weekly duration may result. The author's clinical experiments with cocain cataphoresis have shown that anesthesia of the enamel and dentin takes place only in portions that contain still vital fibrillæ. These fibrillæ are immediately anesthetized upon coming into contact with cocain, while all other local anesthetics applied, with the exception of a mixture of novocain-suprarenin, proved to be entirely or almost ineffective.

[*Journal of the American Medical Association*, Chicago, September 18, 1909.]

OSTEOMYELITIS OF THE LOWER JAW. By Dr. H. H. Germain.

Infection of the lower jaw travels along the mandibular canal with the greatest ease,

while the surrounding medullary spaces act as reservoirs for pus. Hence in the body of the jaw the process is often a diffuse, rapidly spreading disease. As to the etiology of osteomyelitis, it goes without saying that the infectious agent finds entrance into the bony substance by way of the teeth. Probably eight-tenths of all cases arise in this way. Infections from gangrenous pulps or from abscessed teeth are the most common. Impacted third molars, pyorrhea alveolaris, noma, and gangrenous stomatitis also furnish a number of cases. Traumata without fracture may act as predisposing factors, as they produce extravasations and disturbances of circulation which furnish an opportunity for the carriers of infection to settle at the point of injury. Trauma resulting in fracture frequently furnishes a direct path for infection from the oral cavity or outer skin, since the majority of these fractures are compound. Excluding infection from the mouth and outer skin, the remaining cases are the result of hematogenous infection, following acute infectious diseases, as scarlet fever and typhoid, or accompanying a septicemia from any cause.

The sudden spontaneous appearance of gnawing pain is a symptom well known in all cases of osteomyelitis, regardless of situation. This is usually followed by more or less swelling of the soft parts, accompanied by fever, and after a time abscesses form and point into the mouth, or externally through the cheek or outer skin. With the evacuation of pus temporary relief from pain is observed, but with the progress of the disease more abscesses form with recurrence of symptoms. If the process is diffuse, the periosteum is stripped from the bone, and the teeth loosen or are extracted to promote draining of pus. Sooner or later part of the bone dies, and with the casting off of the sequestrum the process usually stops. Not infrequently suppuration and swelling are reduced, and the disease becomes localized; the jaw thickens and the soft parts become dense and indurated. This localized form occurs most frequently in the ramus of the jaw in hematogenous cases, but it may occur in the body, provided good drainage is established. The diffuse form is, as a rule, very acute, impairing the general health rapidly by septic absorption, and also by the fact that the trismus which is present makes it impossible to masticate and swallow food. The patients can open the mouth a quarter of an inch or less, a condition which makes speech, deglutition, and mastication difficult or impossible. It often happens that a large amount of pus is swallowed from discharging sinuses in the mouth. Exactly what controls the size of the sequestrum in an untreated patient is impossible to say accurately. That a total necrosis does not frequently occur seems to be due to an inherent tendency which the marrow possesses to wall off the disease by the formation of dense bone from the endosteum. The time required for the formation of a loose sequestrum varies in individual cases from twelve to twenty weeks, at the end of which a fairly firm involucrum or shell of periosteal bone is formed. For some time the involucrum is soft, and the muscles of the face and jaw produce a certain amount of deformity by shortening the newly formed mandible, if the sequestrum includes the entire diameter of the jaw. As a result of this shortening there is malocclusion of greater or lesser degree. As a rule, it may be stated that the body and the ramus will be reproduced, but the alveolar process will not be restored after destruction.

In practically all cases pus finds its outlet on the facial side of the mandible, either in the mouth or externally. Part of the facial wall often becomes necrotic and is cast off as sequestrum, while the labial side is rarely affected in cases of partial necrosis. When the symptoms in an acute case subside, sinuses form, and the disease takes a subacute or chronic course. A sequestrum is then generally present which must be removed. There is also a possibility that there is a dead tooth, which can give the case the appearance of chronic osteomyelitis. Cases of this kind are frequently seen, the external opening of the sinus sometimes being at a distance from the original cause in the jaw. These tooth sinuses are particularly frequent in the region of the chin, where a dead incisor or canine may be the offending agent. Extraction of these dead teeth may be insufficient for cure, since a pocket of pus and granulations may be present at the apex of the root.

Difficulties in diagnosis will be rarely experienced, syphilis, actinomycosis, suppurating dentigerous cysts, and phosphorus necrosis coming into consideration. The most

valuable information may be obtained by the X ray in cases in which the disease is localized, in which there is a definite sequestrum, or in which fracture is the starting-point of the disease. A careful study of the plates may rule out sarcoma and syphilis in certain doubtful cases, but at times both cancer and sarcoma accompanied by bone destruction are difficult to differentiate from osteomyelitis by any known means except the microscope.

In acute cases affecting the body of the mandible the facial wall of the lower jaw should be removed through an external incision, exposing the inferior dental canal. In this way all large marrow spaces are opened, the best possible drainage is obtained, the firm inner wall is left, which keeps the jaw in shape, and opportunity is afforded to retain the teeth. The gravity of the disease demands radical treatment, and leaves little choice as to whether scars should be left or not. For subacute and chronic cases no method of treatment can be laid down. Generally, the operator should look for diseased teeth, pockets of pus, and sequestra. Sequestra representing the entire thickness of the jaw should be left until a firm involucrum is formed, in order to minimize deformity. These cases need careful watching, as acute exacerbations occur frequently, and are troublesome and dangerous. Trismus is frequently an annoying feature, and rectal or nasal feeding may be necessary. Hot applications externally may give some relief from this condition, which is usually a combination of muscular spasm and inflammatory edema. Lymphadenitis and angina Ludovici may occur at any time. The latter demands immediate surgical intervention.

A number of practical cases, illustrations, and skiagraphs further illumine Dr. Germain's valuable article.

[*Deutsche Monatsschrift fuer Zahnheilkunde*, Berlin, September and October 1909.]

ON THE PATHOGENESIS OF DENTAL ROOT-CYSTS. By Dr. N. A. Astachoff, St. Petersburg, Russia.

After considering the extensive literature published on this subject, and on the basis of numerous very beautiful microscopic sections, the author arrives at the following conclusions: The epithelial coating of the interior of dental root-cysts in most cases owes its origin to the remnants of embryonal epithelium which are continually found in the periosteum. The development of root-cysts is preceded by encapsulated granulomata in the periosteum, which are permeated by strands of embryonal epithelium. These root granulomata containing epithelium are due to chronic hyperplastic periodontitis. They frequently give rise to cysts, most frequently in consequence of purulent softening of the basic tissue, and sometimes in consequence of degenerative alterations (mucous degeneration) of the cells of the epithelial strands. The granulomata containing epithelium may hardly be regarded as cysts which have not yet reached their full development. It is more nearly correct to regard them as peculiar inflammatory neoformations, which frequently develop into cysts. Root-cysts are mostly unilocular, although they sometimes owe their origin to a combination of several cystic cavities. The growth of root-cysts generally is not very considerable, and they rarely reach great dimensions, as they often suppurate, forming fistulæ that drain the pus into the oral cavity. The epithelium covering the cavity of root-cysts is generally polymorphous and arranged in several layers. In many cases it is constructed after the type of Malpighian epithelium, and often exhibits phenomena of degenerative changes, among which mucous degeneration, keratinization of the epithelial cells, and the formation of epithelial bulbs are most frequently noted. In most cases root-cysts develop above the roots of teeth with necrosed pulp, and do not involve teeth or parts of teeth. Root-cysts may sometimes recede spontaneously; the cystic cavity is then obliterated to a hardly noticeable fissure. The epithelium, however, which formerly covered the inside of the cyst is preserved, and fuses with the gingival epithelium after complete atrophy of the alveolus has occurred and the root contained in it has disappeared. In other cases these cysts exhibit progressive growth even after the removal of the tooth at the root of which they had developed. In 98 jaws containing gangrenous roots, 36 cases of epithelial root-granulomata and 52 cases of root-cysts were observed. In the remaining 10 cases the periosteum showed only remnants of embryonal epithelium.

[*Proceedings of the Royal Society of Medicine*, London, June 1909.]

A PRELIMINARY NOTE ON THE ERUPTION OF THE TEETH. By Mr. W. Warwick James.

It has long been known that the soft tissues associated with the teeth contain certain epithelial remains of tooth-band and enamel organ which do not exercise any known function. The author now wishes to show that these remains are not lost at so early a date as is generally thought, but are present up to the period of eruption, and are the determining factor in directing the tooth to its final position in the jaw. After giving a *résumé* of former accounts concerning this epithelium, the author investigates into its character, arrangement, and sources, and with the aid of beautiful microscopic slides essays to establish that the epithelium is produced continuously up to the period of eruption; that there is probably a continuity of epithelial tissue extending between the surface epithelium and the remains of the enamel organ; that the epithelium is derived from three sources: (1) The external epithelium of the enamel organ, (2) the tooth-band and the connecting bridges, and (3) the surface epithelium. After describing the changes occurring in the epithelium and in the connective tissues, the importance of these changes in the eruption of the teeth is considered. The chief function of the epithelium in assisting the tooth in its eruption seems to be that it directs the tooth to its position in the gum. The path of eruption is prepared by the degeneration of the epithelium; the tissues, which are apparently very dense, become loosened and rarefied by the ramifications of the epithelium, and particularly by the changes in the zone of rarefaction. The epithelium probably extends completely from the tooth to the surface. If the continuity be incomplete, the epithelial processes can very readily come into relationship with one another. In the first stages of eruption, the epithelium (ameloblast) is in connection with the tooth, so that the epithelial cap must be carried with the tooth, if it actually moves through the tissues in this stage. It may not do so, for the part played by the epithelial coils may be sufficient to account for the diminution in depth of the overlying tissues. This diminution is brought about by the epithelial coils opening out on the surface, this opening out being largely due to the lateral growth in the tissues with the increase in size of the jaw. This opening out will thus lead to a considerable diminution in depth equal to that of the epithelial coil. It would be of great value to determine the depth of the tooth below the surface at different ages. One factor of considerable importance is the growth of the tooth, which must play a part, although it is quite insufficient to account for the whole process. In the last stages the epithelium lying immediately over the tooth appears to undergo degeneration, but it is almost impossible to gage to what extent the cells have been lost during the process of preparation. Should this change occur, it would undoubtedly aid the process of eruption. It is well known that the cap of tissue overlying the tooth immediately before it erupts can be very readily separated, and it is possible to pass a probe between this tissue and the tooth as far as its neck. It is worthy of note that clinically the first molars are frequently found to articulate immediately the gum is pierced, and in such a case absorption of the gum will play a considerable part in completing the eruption of the tooth, but this factor cannot possibly be of value with regard to the bicuspids.

[*Revue Trimestrielle Belge de Stomatologie*, Antwerp, June 1909.]

REMOVAL OF ADAMANTINOMA (CYSTOMA) OF THE MANDIBLE. By Dr. V. Delsaux.

The procedure of operating, after careful cleaning of the mouth and teeth, is as follows: Two tweezer clamps are placed on the cheek in the direction of the ear. An incision is made between them into the jugular tissues, when the adherence of the tumor to these tissues and the mandible is noticed. The neoplasm extends upward into the pharyngeo-maxillary triangle and under the zygomatic arch. With a few cuts the outer surface of the tumor is laid free. In the case operated upon by the author the ascending branch of the mandible had been resorbed. The tumor was separated from the sound tissues above and toward the pharynx, and its attachment to the maxilla was severed.

It was seen that the tumor had developed between the osseous laminæ. After removal the tumor presented the size of a fist; it weighed 225 grams and was surrounded with a fibrous shell on its external and upper internal surfaces, but not on the lower one. In consistence it was rather hard, with some softer spots, and seemed to resemble dense connective tissue. The large cavity left by the operation was filled for twenty-four hours with tampons of iodoform gauze, and the cheek sewed up in two layers, the lower one with catgut, the upper one with horsehair. Recovery was speedy and complete, with the exception of some persisting granulations in the buccal cavity. The retraction of the cheek and the tendency to malocclusion was corrected by a prosthetic piece.

[*Deutsche Monatsschrift fuer Zahnheilkunde*, Berlin, September 1909.]

THE CORRECT SETTING-UP OF ARTIFICIAL TEETH IN LOWER PROGNATHISM. By Dr. Julius Parreidt, Leipzig.

For the correct setting-up of artificial teeth in lower prognathism the author gives the following valuable indications:

Individual teeth must be inclined labially, if the teeth that have been lost in the mandible have had such an inclination. In the maxilla individual teeth are to be inclined lingually, if they had been arranged in that way in the natural denture. If all upper incisors and canines are missing, and the lower incisors protrude comparatively far, the arrangement of the artificial incisors is determined by the articulation of the canines. If the buccal cusps of the lower canines strike into the masticating grooves of the upper ones, then the upper incisors are to be arranged normally; if the opposite is the case, they are to be arranged so that they strike behind the lower ones. The incisal edges of the artificial incisors should articulate like the buccal cusps of the natural canines. If all upper teeth are missing, the surfaces of abrasion on the teeth of the lower jaw indicate sometimes how the natural upper teeth articulated. The former condition is then to be reproduced. If the case is an edentulous one, and slight prognathism is present, one should try to produce normal articulation. If an old artificial denture is available, it does not always indicate whether the upper incisors should be inclined labially or lingually, for the prognathism shown in the old denture may be an acquired one. In normal articulation the patient, upon being requested to "bite on the molars," though no molars may be present, retracts the mandible; if, however, congenital prognathism is present, the patient pushes the mandible forward.

[*Journal of the American Medical Association*, Chicago, August 28, 1909.]

TRIFACIAL NEURALGIA. By Dr. Frederic V. Hussey.

Facial neuralgia may be classed as minor or major neuralgia. Minor neuralgias are due to peripheral causes, as carious teeth, disease of the antrum of Highmore or nasal sinuses, to hypertrophied turbinates, nasal spurs, etc. The major neuralgias are probably due to a central lesion of the Gasserian ganglion, although in these cases the causes at times may have been peripheral.

The pathology of trifacial neuralgia is still indefinite. Although the investigation along that line has been very extensive, there still seems to be no one definite lesion which can be demonstrated in every Gasserian ganglion removed. At least some of the ganglia examined have given negative results as reported by the pathologist. The lesion when present may be of a degenerative type, interstitial neuritis, or a neoplasm (Frazier). Arterio-sclerosis of the bloodvessels is a common condition seen. In the peripheral nerves there may be an ascending neuritis, which may secondarily affect the ganglion. The treatment of trifacial neuralgia may be arranged under three divisions: (1) Medical stage. Medical treatment is often effective in the minor neuralgias due to constitutional conditions; it includes also local treatment of the nose and mouth, but should not be persisted in too long without results. (2) Peripheral operation stage. Peripheral operation, as neurectomy or avulsion, is often effective in those cases in which one branch of a division or one division alone is affected. This stage includes treatment by injections of 80 per cent. alcohol in the region of the painful nerve, the results of which treatment have been very satisfactory. Cases for peripheral operation or treatment by injections should be carefully selected, and even in those cases there will be a certain percentage

of recurrences. (3) Stage of intracranial operation. Intracranial operations are indicated in all types of major neuralgia where more than one division is affected, and where medical treatment and peripheral operations have been tried and have failed. The operation advocated by Spiller, consisting of a division of the sensory root of the Gasserian ganglion, seems to be the most rational one.

[*L'Odontologie*, Paris, October 30, 1909.]

CURETTING THE ALVEOLUS AND THE ROOT IN CHRONIC ALVEOLAR ABSCESS. By Dr. M. Roy, Paris.

After reviewing the methods that have been previously suggested for the treatment of chronic alveolar abscess, and giving the history of several cases cured by curettage, the author sums up as follows: In alveolar abscess the alveolar lesions are often more extensive than those of the roots. The lesions are generally not localized at the apical portion of the root, which is affected only to a limited degree, but extend more or less considerably over one or more of the lateral surfaces, which are consequently denuded of ligament. Consequently the suppuration is not simply due to the denudation of the apex, which therefore would act as a foreign body of which the organism tries to rid itself, as some authors are wont to suppose. The preservation of the denuded portion of the root does not prevent the disappearance of the suppuration and closure of the fistulous tracts, if the infection which is the primary cause of the abscess has been removed and the abscessed area has been thoroughly cleansed. By resection of the apex all the diseased portions are not always removed; on the contrary, sound portions of the root are frequently sacrificed. Chronic alveolar abscess, according to its extent or situation, should be treated by removing the causative factors in the most direct way, *i.e.* by removing the pulpal infection by way of the root-canals, the alveolar abscess by way of the fistulous outlet. In alveolar abscesses which have resisted disinfection of the root-canals and superficial cauterization of the abscessed pocket or the fistulous tract, curettage of the alveolus and the root is indicated, as it is also in the treatment of root-cysts.

Curettage of the alveolus and the root consists in a complete cleaning of the abscessed area by way of the fistulous tract. A vertical incision is made by means of a bistoury or, better, thermo-cautery, into the mucosa at the level of the apex of the root or by way of the fistula present. Open the alveolar fistula, and if necessary enlarge the opening in order to freely uncover the abscessed area. Then with a round bur the alveolar walls and the affected portions of the root are curetted without interfering with the sound portions of the root or making a resection of the root. The wound is swabbed with a 1:10 solution of zinc chlorid and left alone without tamponade, the root-canal is disinfected, and filled (with a temporary filling) during the subsequent week. Healing takes place in from four to six weeks. The operation is practicable in multi-rooted teeth as well as in single-rooted ones. Without removing an excessive mass of tissue the field for this operation must be clear, and the best possible hemostasia must be established, in order that only the diseased portions be removed, and the sound parts of the root and alveolus remain intact. This operation has yielded excellent results in all teeth, upper and lower. The presence of root-portions denuded of ligament, even to a great extent, has never retarded the disappearance of the suppuration after the operation, nor the perfect cicatrization of the abscessed cavities.

[*Deutsche Monatsschrift fuer Zahnheilkunde*, Berlin, August 1909.]

MICROSCOPIC INVESTIGATIONS ON THE ERUPTION OF THE PERMANENT TEETH AND THE RESORPTION OF THE DECIDUOUS TEETH. By Dr. Guido Fischer, Greifswald.

Fischer offers a *résumé* of his monograph, "Contributions to the Eruption of the Permanent Teeth and the Resorption of the Deciduous Teeth, with Investigations on the Genesis of the Osteoclasts and Giant Cells," which appeared as No. 116 of Merkel and Bonnet's "Anatomische Hefte." This article, which is illumined by a liberal series of exceptionally fine micro-photographs, represents an epitome of his very valuable studies in this field.

The first phenomena of resorption are produced by the appearance of hyperemia in the dental follicle. Dense capillary plexuses with numerous osteoclasts and giant cells protrude

at the osseous border, eating bay-formed hollows into it. The process of dissolution, moreover, spreads inside of the spongiose tissue by way of the Haversian canals, as well as by the aid of penetrating tissue proliferations. The extent of this absorption is governed by the direction of the growth of the dental germ. Beside this dissolution a continuous building-up of new hard substances (bone, cement, and dentin) takes place, going on with less intensity, however, than the resorption, so that finally the newly formed layers disappear together with the original basic tissue. Through the progress of the hyperemia from the germ, one tissue after the other—spongiose tissue, periosteum, cement, dentin, and pulp of the deciduous tooth—are forced to disappear. Opposite the advancing point of the germ the united enamel epithelium atrophies shortly before the eruption of the young crown, while the side wings of the enamel epithelia have united with the mucosa which has sunk in from above, and form the mucous papilla at the neck of the young tooth. Consequently the enamel epithelium, after completion of the enamel formation, is further differentiated into mucous epithelium. The shape and form of the root is controlled by the epithelium in the same way as that of the crown. The enamel epithelium of the reflected portion of the germ extends toward the apex in form of a closed strand of cells in front of the youngest layer of odontoblasts. The tender epithelial sheath lying back of it is perforated by cementoblasts and Sharpey's fibers, so that a wide-meshed epithelial net originates, which is situated between the epithelial convolution and the epithelium of the mouth. In this meshwork a conglomerate of large cells forming epithelial nests are noteworthy, which have been described by Malassez as scattered remnants but which in reality communicate by means of fine cellular processes. With the closing of the apical foramen the basic epithelial convolution spreads out in net shape. Thus a texture of epithelium of wide or narrow meshes is formed which covers the entire root, and is of primary importance in the development of cystic tumors, owing to its relationship to the oral epithelium, which is capable of regeneration.

The actual dissolution of the tissues of primary dentition is partly due to the resorbing faculties of the capillary buds, partly to the endothelium coming from the vascular wall, which may develop into osteoclasts or giant cells. In the area of most pronounced dissolution these occur as mononuclear osteoclasts at first, but become independent and develop into giant cells. Within this rapid resorption, however, a proliferation of endothelium takes place in connection with the vascular wall, which extends at the expense of the interior cavity. This cavity becomes narrowed and is finally obliterated, until the entire area of obliterated capillaries is separated from the context of the vessels, and becomes an independent giant cell of coarse structure. In this way the author has demonstrated for the first time in an indisputable way the origin of osteoclasts and giant cells from the vascular endothelium.

The giant cells themselves represent retrograde formations, which perish after having reached a certain stage of development. At the same time polynuclear leucocytes intervene, causing the more subtle assimilation of the giant-cell plasma.

The resorption of the deciduous teeth is by no means the product of the resorbing activity of individual tissues of the primary dentition, but is brought about by the various influences which the growing germ exerts upon its surroundings. Besides the conditions of tension, the disturbances in nutrition, above all, caused by the growth as well as the more subtle biochemical conditions of alteration in individual cells and in whole tissues which are situated in the direction of the erupting germ, play an important rôle.

During the entire process of eruption the vascular system is the determining factor, and must be regarded as the real cause.

PERISCOPE.

A Good Sprue Wire for Inlays.—Old needles used with a Victor talking machine make good sprue wires for inlays.—R. E. COCKRELL, *Dental Summary.*

Tannic Acid for Neuralgic Pains Due to Pyorrhea Alveolaris.—For neuralgic pains due to pyorrhea, a twenty per cent. solution of tannic acid in alcohol, swabbed on the border of the gums of the affected side, is very effective.—M. M. BETTMAN, *Pacific Dental Gazette.*

Preventing the Hardening of Rubber.—To prevent the hardening of articles or instruments of rubber, keep them in a tin can containing talcum. If they need softening, bathe them in ammonia water, afterward passing them through glycerated water.—*Revue Trimestrielle Belge de Stomatologie.*

Breaking of Contraction or Expansion Arches.—The breaking of contraction or expansion arches frequently occurs at the portion where the thread begins. In order to avoid this, the arch is held at that place with a pair of flat tweezers in such a way that part of the thread and part of the smooth wire is held in the tweezers, thereby preventing a breaking of the weak portion.—*Geo. Poulson's Bericht.*

Repolishing Artificial Teeth After Grinding.—To re-establish the high polish in artificial teeth after grinding, the ground surfaces are first rubbed with very fine emery or other abrasive paper, and then polished with a wood stick dipped into the residue left from the grinding. The final polish is imparted to the teeth by means of a polishing brush on a lathe dressed with the same material.—*Journal Dentaire Belge.*

Taking the Bite in Edentulous Cases.—In edentulous cases, the wax strip is inserted into the mouth, and the patient is required to "bite on the molars." This may seem ridiculous, since no molars are present, yet the patient will bite correctly. If this request does not yield the desired result, you may hold the wax strip over the mandible with your fingers, and request: "Please bite, but not my fingers!" Generally the patient immediately retracts the mandible, and meanwhile the fingers are quickly taken off. Patients with normal occlusion retract the mandible in masticating, during incision they push it forward. In congenital prognathism, the case is reversed—the mandible is pushed forward in mastication, retracted in incision. If sufficient attention is paid, this method will indicate in taking the bite whether congenital prognathism is present or not.—JULIUS PARREIDT, *Deutsche Monatsschrift fuer Zahnheilkunde.*

Lime-water as a Mouth-wash.—Lime-water is one of the best mouth-washes. It should be made at home and used *profusely.*

Place about a cupful of unslaked lime in a half-gallon bottle, fill it with water, cork well, and shake several times during the day. Upon the following morning pour off most of the water, which contains the washings of the lime, and throw away. Fill the bottle again with water and shake well. When settled, decant the water into smaller bottles to be kept upon the toilet stand. As long as any lime remains, water may be added, when the bottle should be shaken.

For use, dilute the lime-water with about an equal part or more of water. Keep bottles well corked.—C. E. KELLS, JR., *Items of Interest.*

Advancing the Jaw in Cleft-Palate Cases.—This is done only when the cleft is extreme in width. The most desirable age in which to do this is the first few days of infancy. It has, however, been successfully accomplished during youth, and even during adult life. If done early the space may be very much lessened by compressing the malar bones together with the hands. This may necessitate fracturing the bony attachment of the malar bones. Once brought together and held securely by wire or rod, the soft tissues of the inner mouth may be adjusted to close the cleft; afterward the defective hare-lip may also be corrected. The dangers of fracturing the malar bone are insignificant; the greatest danger lies in injuring the spinal meninges, should the fracture become intracranial. Partial clefts, when the rent is anterior, involving only the teeth-bearing area, may be easily obliterated by bringing together the

fragments after the alveolæ have been divided. These fragments may be held in perfect apposition by sutures of wire or other non-absorbable material. A protruding vomer may be pushed backward after its bony attachments have been fractured or incised. The vomer should not be sacrificed if it can be utilized with reasonable assurance that it can be preserved.—B. M. RICKETTS, *Lancet-Clinic.*

Annealing Broaches.—Select the Swiss broaches that are tapered (they are better than the English), use a pan ½ in. deep and 6 or 7 in. in diameter, fill it with fine asbestos and put the broaches in, the points toward the center. Cover with asbestos and put a close-fitting lid on, set it on a burner for one hour, with about the amount of flame used for vulcanizing, and allow the pan to become perfectly cold before removing the broaches.—J. A. LIBBEY, *Dental Summary.*

Sharpening Files.—To sharpen files, boil them in a potash solution, brush them with a very hard brush, thoroughly dry them, and for thirty seconds dip them in nitric acid, and pass over them with a piece of linen spread over a weaver's card. The acid in that way is left in the fissures only, and eats into the steel without affecting the surface which has been dried by the linen. The same procedure may be repeated until the desired depth is obtained. The files must be afterward carefully rinsed in water, and dried.—*Revue Internationale de Prothèse Dentaire.*

Paraform in the Treatment of Sensitive Dentin.—Spiller advises the use of paraform 5 parts, mixed with oxysulfate of zinc, 100 parts. This is then mixed with an aqueous solution of gum arabic to the consistence of a stiff paste. It may be covered with a temporary gutta-percha stopping. He says the dressing should be left in from one to seven days or longer. At the end of this time the cavity may be cut with practically no pain in nearly every case. Pain occurs from the dressing in a small percentage of cases, and is usually not localized in the tooth under treatment; it is seldom severe, and does not last long. The insensitivity does not extend to the pulp, the penetration usually being about the thickness of a thick post-card. The paste should not be placed in an aching tooth or too near the pulp, and if the cavity is a deep one, the deeper portions should be protected from the action of the drug, the influence of which would thus be confined to the edges of the cavity.—J. A. WOODS, *Dental Record.*

Simple Splint for Fracture of Lower Jaw.—In simple fractures, where teeth are missing, so as to prevent adjustment either by interdental splint or by any plate resting on the gums at the site of the fracture, the following appliance has given good results: A chin-rest is cut from a tin dipper, which is prepared in a few minutes with a pair of shears, pliers, and an awl. The dipper is cut to fit the chin and jaw, sheared out in front deeply enough to reach one inch below the mouth, and at the back so that the posterior wing of the splint will reach to the ramus and as high as the condyles. The splint is padded with sterile gauze and adjusted to the chin and jaw by four strips of bandage that are attached to a closely fitting head-cap, thus preventing the apparatus from being twisted to the side. This device allows of an easy change of the dressing, which is very necessary on account of the flow of saliva soiling the padding and the dressing. The splint is unaffected by flexion or extension of the chin or rotation of the head.—D. S. MIDDLETON, *Internat. Journ. of Surgery.*

Formalin and Adrenalin Chlorid in the Treatment of Hypersensitive Dentin.—For the past year the writer has been using a solution composed of formalin and adrenalin chlorid, equal parts. As the technique of the operation is of importance it will be described in detail. The cavity is opened, and as much of the carious dentin removed as can be done without pain. A dressing of sodium bicarbonate is then placed in the cavity and left for one or two days; this, of course, when circumstances will permit. The purpose is to neutralize the acids present and permit the fibrillæ to return, as far as possible, to normal conditions. The rubber dam is then adjusted over the tooth, the cavity dried out with a pledget of cotton or spunk, and flooded with alcohol. A blast of warm air is directed into the cavity until the alcohol is vaporized. This is repeated about four times. The last time the air is used warmer and warmer, until quite hot blasts are directed into the cavity. This will not cause pain if carefully done, as the gradual increase of heat establishes a condition of tolerance in the pulp. A small pledget of cotton is then dipped in the formalin and adrenalin mixture and placed in the cavity. A piece of unvulcanized rubber is placed over it, and pressure put upon it with as broad an instrument as can be used. The pressure is maintained and gradually increased for three or four minutes. At the end of that time, if the technique has been carried out as described, the excavation can be made

without discomfort in a large majority of cases.

The obtunding effect of this preparation is probably due to the hardening action of the formalin, and also, to some extent, to its affinity for water, and to the astringent action of the adrenalin, the effect of the combination being to so harden and constrict the fibrillæ as to inhibit their conducting power. It is possible that they do not rally from this condition, that is, that they are killed and not anesthetized. The application causes no pain as is the case with the acids and alkalis, and as the penetration is not very great, it would really make little difference which effect is produced unless one is working in immediate proximity to the pulp. It may be considered perfectly safe in any cavity not extending to a greater depth than three-fourths of the distance from the periphery of the dentin to the pulp.—F. G. Worthley, *Western Dental Journal.*

Constitutional Treatment in Pyorrhea.—If pyorrhea is due to an insufficient elimination of uric acid and other waste products, the patient should be instructed to drink large quantities of water daily, to take plenty of outdoor exercise, and to be careful in the manner of living, especially as to diet. Coarse breads, such as graham, corn, and whole wheat, fruits, nuts, and vegetables should be the principal diet. To further assist nature in the elimination of waste products, a good uric acid solvent and antacid should be prescribed. If there is any doubt as to the presence of a systemic derangement, an analysis of the urine should be made, either by the dentist himself or by the family physician. It is an easy matter and takes but a very short time to determine the specific gravity of the urine, as well as the reaction and the presence or absence of albumin, sugar, etc.—M. M. Bettman, *Med. Sentinel* per *Therapeutic Gazette.*

Salivary Examination for Potassium Sulfocyanate.—Before undertaking the treatment of any case it is imperative that the dentist should first secure a specimen of his patient's saliva, and test the same by methods which are about to be described. Until this is done he is in no wise competent to undertake the treatment.

A most convenient method for securing a proper sample of the patient's saliva is to place a small beaker on an operating tray, and with a mouth-mirror and exploring instrument begin examination about the teeth, as if looking for cavities to be filled, keeping the patient's mouth open constantly, until a considerable accumulation of fresh saliva is observed. Request the patient to spit this into the beaker instead of a cuspidor. I adopt this method of securing a sample because I find that otherwise the patient is apt to attempt to hawk the mucus up from the throat, thereby sometimes contaminating the specimen with catarrhal and other objectionable secretions. For each examination I require about 4 ccm. of saliva.

First examine the specimen to determine whether there is naturally an abundance of potassium sulfocyanate in the saliva. A method for doing this is to place 2 ccm. of saliva in a small test tube, adding an equal quantity of distilled water and shaking the mixture well together; next add 5 drops of an aqueous saturated solution of iron perchlorid and again shake. If the resultant color is a pale lemon, I conclude that there is no potassium sulfocyanate present; if a light amber, there is only a little.—F. W. Low, *Dental Summary.*

Inlays as Abutments.—In the application of inlays as "abutment-pieces" or "attachments" for fixed bridgework, in the formation and preparation of the cavity every precaution must be observed to insure a secure mechanical fixation of the inlay. This is necessary because any inlay for a simple restoration—much more one which is to be utilized as a support for bridgework, which depends entirely upon cement for its retention—will usually fail, and particularly if it is to be subjected to stress in any direction.

In addition to such favorable mechanical formation, at least one and sometimes two short pins, made of from 18 to 20 gage round iridio-platinum wire, should invariably be used in teeth having vital pulps, and larger and longer ones if the pulp has been removed, as a means of obtaining every possible degree of security and permanence in the attachment of the inlay to the tooth.

When such pins are used in vital teeth, holes should be drilled (using a bur of the same size as the wire) into the base of the cavity at a point which will be least likely to expose the pulp, and parallel with the axial walls of the cavity, and with each other if more than one is used. They should extend into the dentin as far as possible without endangering exposure of the pulp, and project beyond the hole and into the body of the cavity sufficiently to admit of their becoming securely attached to the wax in molding it to the cavity. When so fitted they should be threaded with a "tap" or notched with a file to insure attachment

of the gold in casting and of the cement in mounting.

In pulpless teeth one pin is all that is necessary, but this should be about 16 gage in size and should extend through the pulp-chamber and into the canal to a slightly greater extent. In cases where it seems impossible to drill holes of such depth as will insure adequate strength in the attachment of the inlay to the tooth without endangering the life of the pulp, devitalization may be demanded and should be resorted to when any question of doubt or uncertainty arises.—H. J. Goslee, *Items of Interest.*

Hints on Vulcanizing.—In vulcanizing it is of greatest importance to have a perfectly functioning thermometer and manometer. In order to attain this end, the apparatus should be first heated to about 100° C.; then the steam escape valve is opened for a moment in order to allow the air still present in the vulcanizer to escape. This is of great influence on the correct functioning of the thermometer and manometer.

The hornlike toughness of the rubber in vulcanizing is best obtained by allowing the gas to develop and escape very slowly. The more rapidly and highly the heat is raised, the more quickly the sulfid of hydrogen escapes, and the less perfect the hardening process will be. If the heat is raised too rapidly, the rubber hardens too quickly on the surface, and becomes porous interiorly, because the gas cannot escape completely.—*Geo. Poulson's Bericht.*

"Amberline" (Dr. Flagg) for Retarding Caries and Reducing Hypersensitivity of Dentin.—The formula and directions for making Dr. Flagg's Amberline, with and without the addition of chalk, are as follows:

℞—White tallow soap (without borax) shaved,	6	lb.
95 per cent. alcohol,	3	pints
Water,	2	"
Merck's oily carbolic acid, oil of cloves (shaken together and stood 6 to 12 mos.), each	6	drams.
℞—Oil of wintergreen,	3	"
Oil of cinnamon,	6	"
Alcohol to cut oils,	2	oz.

Place the water, alcohol, and soap in a double boiler, warm and stir until dissolved. Cut the oils in the second quantity of alcohol and add. Take the soap off the fire, cover it closely, and when it thickens, pour it into molds. When dry cut and box it.

℞—White tallow soap,	1	lb.
Water,	1	pint.
Carbolic acid, oil of cloves (mixed 6 to 12 mos.),	3	drams.
Oil of wintergreen,	3	"
Oil of cinnamon,	3	"
Alcohol to cut oils,	4	"
Add chalk when it thickens and pour into molds.		

The soap used several times a day with a brush markedly retards decay and greatly reduces hypersensitivity of dentin, while the addition of chalk supplies the abrasive quality often necessary.—T. D. Casto, *Garretsonian.*

Setting All-Porcelain Crowns.—The weak and vulnerable joint between all-porcelain crowns and the stumps on which they are mounted may be greatly improved by interposing a disk-like casting of pure gold between the crown and the root-end. This casting will be of such detail that one of its sides will accurately fit the cut end of the crown, and its other side bear the same relationship to the root-end. This adaptation can be as accurate as the adaptation of an inlay to the cavity walls, and may by this accuracy be made the means of reducing the cement line between the crown and the root-end to such a minimum that its vulnerability may be dismissed as being unimportant. Stumps that present irregular ends caused by fracture or caries can also be fitted with the same degree of accuracy, and with as much ease.—J. G. Lane, *Dental Digest.*

Quick Method of Repairing Fractured Rubber Plates.—We are often confronted with small fractures in vulcanite dentures. In some instances we do not find sufficient time to properly repair such cases, and as a result must keep our patients for some time without their dentures. This may be obviated by a very short method: In repairing a cracked or broken plate make a model of the denture in plaster. Take an inverted-cone bur and cut the entire length of fracture, thus making a groove about one-fourth inch wide and completely through the plate. With a large wheel bur, cut small grooves about one-sixteenth inch apart around the fracture. These small grooves must be perpendicular to the large fracture. Place the denture upon the model ready to pack. Cut vulcanite rubber in strips one-quarter of an inch wide and as long as the fracture. With a spatula place two strips together, one upon the other,

and heat gently over the flame of a Bunsen burner. Care should be taken not to allow the rubber to burn. When the rubber has become soft and pliable, place it in the fracture and press it hard with the thumb. With a hot spatula trim off the surplus rubber. With a pledget of cotton saturated in chloroform smooth off the rubber and place over it a piece of tin foil. Place the case in the flask, tighten the bolts and vulcanize at 320° F. for 50 minutes. A repair made in this manner is practically finished when taken from the flask, while the time consumed is about two and one-half hours.—J. J. SCHEMBS, *Dental Summary.*

Indications for the Expansion of the Maxilla.—At what age are we to undertake the expansion of the maxilla? I think I may indicate as the lowest limit the fifth year of life. I should not like to begin expansion earlier, because I found in the case of a child that the pressure upon the maxilla had the effect of forcing the eruption of the permanent teeth. At the end of the fifth year this is of less consequence than at an earlier age, as the natural eruption of the teeth usually commences at that period. Later on we are not dependent upon any age. As long as the palatal suture still contains connective tissue, so long may we reckon upon a successful result in maxillary expansion. In youth we find along the maxillary suture, on the mucous membrane of the hard palate, a white shimmering line, which is also visible in the center of the soft palate. This line appears to me to go hand-in-hand with the connective tissue of the bone suture. As soon as this connective tissue has become ossified, this white line usually disappears, but it also happens that we find this white line—which may be called the suture of the mucous membrane of the palate—present in old people. We must assume in such cases that the maxillary suture has not yet been ossified. Rhachitic maxillæ are difficult to expand in young life, and the white line in the suture of the mucous membrane is missing, at all events on the hard palate. The duration of treatment varies. In youth rapid expansion of the maxilla is more possible than later; much depends upon the connective tissue of the suture of the maxilla. The less the suture is ossified the less resistance the maxillary halves offer. In expansions the greatest prospect of success is during the years of development, since we have then combined the yielding of the palatal suture with the solidity of the maxillary bone, upon the side walls of which the entire pressure of the appliance rests.

As to the time necessary for the completion of the expansion and the cessation of mouth-breathing, three months of constant pressure by means of the spring screw should lead to success during the years of development. I am accustomed, however, to go beyond this period of time in carrying out the expansion, so as to make sure that it is sufficient to prevent difficulty in nasal respiration, should a cold in the head at any time lead to swelling of the mucous membrane of the nose. In old people, of course, the expansion takes longer, as greater resistance is to be expected from the palatal suture. In such cases I am in the habit of proceeding more slowly with the expansion, so as not to irritate the mucous membrane of the palate in any way. The pressure of the spring screw must keep pace with the yielding of the palatal suture. I am also accustomed with old people to construct larger plates for the palate than for young people; in very difficult cases they may cover the major portion of the palate. In very narrow palates one spring screw is frequently insufficient. Once the palate is expanded it retains the altered configuration, as new osseous tissue has been formed between the maxillary halves. Moreover, the palatal roof is not influenced by the occlusion of the mandible. Therefore I would lay it down as a postulate that every case of regulation of the upper teeth should be begun with expansion of the maxilla, for only in this way are we able to finally secure the position of the teeth which we have obtained.

We must, therefore, in cases of this kind, starting from the anatomical standpoint, travel the road of nature backward, and continue to build farther where nature offers us the first opportunity to this end. When, starting from the suture, we make the maxilla broader, we first lay the correct foundation. The necessary consequence of this broadening is a widening of the extent of the alveolar border, and by this means a gain of space is secured for the individual teeth. When this space has been obtained, we have removed the chief impediment, and the muscles of the tongue and lips are able to develop their supporting forces. Only when these forces are too weak, or when, owing to abnormal anatomical conditions, they cannot come into action, are we justified in calling to aid our mechanically acting appliances, and then always on the basis of the expanded maxilla.—R. LANDSBERGER, *Correspondenzblatt für Zahnärzte.*

OBITUARY.

DR. HENRY R. JEWETT.

DIED, suddenly, of heart failure, in Atlanta, Ga., November 10, 1909, HENRY R. JEWETT, D.D.S.

Dr. Jewett was born in Griffin, Ga., in 1859, and was graduated from Emory College in 1879. After leaving college he conducted a successful drug business in Decatur, Ga., for twelve years, when he began the study of dentistry, and was graduated from the dental department of the Southern Medical College in 1892. As a student he was distinguished for the excellence of his work, being one of the honor graduates of his class.

The year following his graduation he became connected with the college in the capacity of demonstrator, and it was not long before his special fitness as a dental teacher placed him in the chair of prosthetic dentistry. He has been connected with the Atlanta Dental College ever since its organization, and has been a very important factor in its rapid growth and progress. He served as dean for three years, from 1901 to 1904, and his management of affairs was very successful. In 1909 he became treasurer of the college, and to the time of his death was very active in its management.

In addition to his college work and practice, Dr. Jewett has been a factor in national and state associations, and was an officer of the National Association of Dental Faculties. The attachment of the dental students in the Atlanta College to Dr. Jewett was very marked. He was always their friend and adviser, and always carried the spirit of good fellowship in his dealings with "the boys."

Of a very genial nature, courteous and friendly at all times, his loss will be greatly felt by the hundreds of friends in the college, dental societies, and fraternal organizations with which he was connected. He had held important offices in various orders and had a large *clientèle* devoted to him by reason of his personality and his skill in his profession.

His death occurred very suddenly on an Atlanta street-car as he was leaving for his home. Seated by his wife, he was engaged in conversation, when without warning his head fell forward upon his breast and he died immediately. He leaves a wife, four daughters, and one son, Henry R. Jewett, Jr. The funeral services were conducted from his residence in Decatur, November 12th, there being a large attendance of friends, the Atlanta College students being present in a body, together with representatives of the dental and medical professions from Atlanta.

On behalf of the alumni of the Atlanta Dental College, those residing in Atlanta forwarded to the bereaved family the following tribute to Dr. Jewett's memory:

TO THE FAMILY OF DR. H. R. JEWETT:

It is with saddened hearts that again the alumni of the Atlanta Dental College residing in Augusta are called upon to render sympathy to the bereaved in their hour of affliction. The young men who have gone out from the Atlanta Dental College feel that we were a family, and the care manifested by our instructors in our preparation for the life-work we have chosen was akin to the interest manifested by a father for his sons. Dr. Jewett, you are gone! We all shall miss you; no one can fill your place in our hearts!—but as in our college days we prepared to meet you in the classroom, and give an account of how well we had occupied the time since you were last before us, may we each and all, as we pass through this stage of existence, be faithful to the trust imposed upon us, and at last, as we are called upon to enter the great beyond, may we enter where you have gone, and hear as you have heard, "Enter into the joy of thy Lord."

To the family and friends we extend our most sincere sympathy.

WALTER C. MILLER (Class '00),
GEO. M. WOODBURY (Class '00),
R. H. CALHOUN (Class '04),
J. T. WHITLAW (Class '05),
C. E. BLANKENBURG (Class '07),
ORLIN K. FLETCHER (Class '08).

DR. WILLIAM HORTON LOOMIS.

DIED, at his home on Park st., Rockville, Conn., on November 7, 1909, of neuritis following nervous prostration, Dr. WILLIAM HORTON LOOMIS, in his sixty-eighth year.

With the demise of Dr. William Horton Loomis, one of Rockville's best-known and most highly esteemed residents, who had been prominently and actively identified with the business, professional, and political life of that city for forty years, and who as a dentist had enjoyed a state-wide reputation, has passed away.

Dr. Loomis was born in West Springfield, Mass., on April 17, 1842, as the son of Francis Dwight and Laura M. (Brown) Loomis. He received his education in the high school of Westfield, Mass., Williston Seminary, Easthampton, Mass., and the Connecticut Literary Institution, Suffield.

He enlisted at Westfield on May 4, 1861, as a private in Company K, Tenth Regiment Massachusetts Volunteer Infantry, and was promoted to corporal, sergeant, and first sergeant consecutively. He was engaged in seventeen battles, wounded at Cold Harbor, Va., and honorably discharged in July 1864.

After leaving the army, Dr. Loomis located in New Haven, where he took up the study of dentistry in the office of Dr. Elias Strong, serving an apprenticeship of four years, from 1864 to 1868. He then successfully practiced dentistry in Rockville, Conn., until January 1909, and was considered a master in his profession. For two terms, from 1901 to 1904, he served as state dental commissioner, which honor was conferred upon him in recognition of his marked ability. He declined to accept this position again at the expiration of his second term. During the forty years of his practice he was a member of the Connecticut State Dental Society, also a member of the Northeastern Dental Society and the Hartford Dental Society, being recognized as one of the leaders in his profession. Dr. Loomis was a public-spirited citizen, who took a lively interest in the welfare of the community, serving as a member of the Knoxville city council for six years with credit and distinction, and in 1899 was elected mayor of that city, and re-elected in 1901, his administration of the city's affairs being most efficient.

Dr. Loomis was a widely known member of the G. A. R., charter member of Burpee Post, and junior vice-department commander of the Connecticut G. A. R. He was also prominent as a Mason, being a member of Fayette Lodge of Rockville, also Adoniram Council and Chapter, Washington Commandery, No. 1, Knights Templar, of Hartford, and Sphinx Temple of the Mystic Shrine of that city. Dr. Loomis was also a member of the Connecticut Army and Navy Club, and the Connecticut Society of Sons of the American Revolution. He was a member of the House from the town of Vernon in 1904, serving on the important committee on humane institutions, and being a member of other special committees.

In public life, Dr. Loomis was the soul of honor and probity, in social life genial, kind, easy to approach and of a most companionable nature, in professional life conscientious, painstaking, and admirably skilful, in home life most devoted and loving. He was married on April 19, 1866, at Brooklyn, N. Y., to Anna R. Merrifield, who with two sons, William F., of Hartford, and A. Clayton, of Newark, N. J., survives him.

The funeral services were in charge of Fayette Lodge.

DR. JOSEPH DONAHEY MOODY.

DIED, after three days' illness, of heart failure, at Los Angeles, Cal., November 24, 1909, JOSEPH DONAHEY MOODY, D.D.S., aged sixty-eight years.

Dr. Moody was born in Ashland, Ohio, in 1841. In 1861 he enlisted as a private in Company H, Forty-second Ohio Infantry, Col. James A. Garfield commanding, serving three years and two months without wounds or serious illness. He was secretary to Colonel Garfield till the latter was promoted. Dr. Moody had a treasured letter from General Garfield, written from the battlefield of Shiloh, to which was added this postscript: "I am very sorry you are not still my clerk." Dr. Moody was in detached service in the brigade quartermaster's department for nearly a year, and was then promoted to second lieutenant and assigned to Company I. At the beginning of the Vicksburg campaign he was placed in charge of the ambulance corps of the Ninth division, General Osterhaus commanding. Returning to his regiment in

the spring of 1864, he was appointed first lieutenant, and later adjutant.

Soon after his discharge from the army he began the study of dentistry, as the custom then was, in the office of a preceptor. He practiced first in Upper Sandusky, Ohio, and later in Mendota, Ill., where he remained for twenty years. He took a course in the Chicago College of Dental Surgery and was graduated in March 1885. In February 1893, he removed to Los Angeles, Cal., where he was engaged in active practice until within a few days of his decease.

While living in Illinois, Dr. Moody was a valued member of the Illinois State Dental Society, also of the Central Illinois and Chicago Societies. At Mendota he was for several years president of the city board of education.

After his removal to California, he soon became identified with the Los Angeles and Southern California Associations, and in due time became president of each. He also engaged in educational work, being for several years and up to the time of his death professor of hygiene and ethics in the college of dentistry, University of Southern California.

As a dentist, Dr. Moody was industrious, painstaking, and skilful; in relation with the members of his profession, courteous, kind, and ethical in the highest degree. He was one who illustrated in his own life the principles he advocated. He pleaded with great earnestness that a dentist should be broadly educated, a fully developed, all-round man.

He read widely and thought deeply upon current questions. He was an active member of the Southern California Historical Society, also of the Southern California Academy of Sciences, was much interested in archeology, and made one of his chief diversions the field study of botany.

Dr. Moody was a deeply religious man, a very thorough Bible student, a sincere Christian. From the age of seventeen to the end of life he was a faithful member of the Presbyterian Church, for many years an elder. He was particularly identified with Sunday-school work, both in Illinois and California, having been for several years superintendent of Sunday-school normal work for Southern California. In the Southern California Dental Association he was often spoken of as "our chaplain," and was always ready to offer the opening prayer in absence of a clergyman.

The respect in which Dr. Moody was held by his neighbors, patrons, and professional brethren was fully attested by the large attendance at his funeral, which was held in the Hyde Park Presbyterian Church of Los Angeles, Friday, November 26th.

His widow, Dr. Kate Cameron Moody, whom he married in Jessup, Iowa, 1869, survives him.

Their only child, a daughter, died at the age of five years, in Mendota, Ill., to which place the remains of the father were conveyed for burial.

GARRETT NEWKIRK.

DR. GERMANUS KNEPPER.

DIED, at Los Angles, Cal., October 24, 1909, after a surgical operation, Dr. GERMANUS KNEPPER, in his seventieth year.

Dr. Germanus Knepper, a pioneer dentist of Los Angeles, Cal., died at his residence, 1009 Manhattan Place, on October 24, 1909. He had undergone a severe surgical operation from which he never rallied, and it was only his remarkable vitality that prolonged his days.

Dr. Knepper's father was a well-known minister of the German Reformed Church in Western Pennsylvania and Maryland, where the Knepper family, of German descent, has been prominent and honored for more than a century.

Dr. Knepper received his early education in the public schools and academies of Pennsylvania and Maryland, and on attaining his majority moved to Illinois, where he remained until the outbreak of the civil war. He enlisted in a regiment of the Illinois Volunteer Infantry, and went to the front, experiencing much hard campaigning, including Sherman's march to the sea, and participating in many battles.

After the war, Dr. Knepper studied dentistry, and began practice at Marshalltown, Iowa, where he remained until 1886, when he joined in the Marshalltown hegira to Southern California. He located in Los Angeles, and opened an office, building up a large practice and working steadily until ill

health compelled him to retire in the spring of 1909.

Dr. Knepper was a man of sterling character, genial disposition, and lofty patriotism. He was an honored member of Stanton Post, G. A. R. In politics he was a lifelong republican, and took great interest in matters pertaining to the welfare of the city of Los Angeles, where his demise is sincerely mourned by a large circle of friends and former patients.

Besides his wife, Dr. Knepper leaves a daughter, Mrs. Norwood Smith of Berkeley, Cal., and a son, Earl H. Knepper, a mining engineer. Cremation was held on October 26, at the Rosedale Cemetery, and burial in Inglewood Cemetery.

DR. ERNEST L. HALL.

Died, at Oxford, Me., July 9, 1909, of appendicitis, Ernest L. Hall, D.D.S., of Augusta, Me.

Dr. Hall was the only son of Horace A. Hall of Bridgton, Me., and was born in Oxford, Me., May 27, 1876.

The family moved from Otisfield to Bridgton, where Dr. Hall attended Bridgton Academy, being graduated in 1894. The fall of the same year he entered Bowdoin College, being graduated in 1898. Afterward he took the dental course at the University of Pennsylvania, obtaining the degree of D.D.S. in 1901.

The same year he purchased the practice of Dr. Briggs of Augusta, Me., where he had been meeting with success such as is granted to but few. He had the most promising career of almost any of the younger men in the profession.

Recently he was appointed on the examining board of the state, and was prominent in the Maine Dental Association.

In 1902 he married Miss Florence S. Hayes of Oxford, who, with two daughters, survives him.

Dr. Hall and family were at the parental home of Mrs. Hall, where they had gone to spend the Fourth. He was taken ill and found to be suffering from a severe case of appendicitis. An operation was considered necessary, and this was performed by experienced surgeons. Although his friends early in the week were aware that his condition was critical, they were not prepared for his death, which came Friday noon, July 9th.

The funeral services were at Oxford, Sunday, July 11th, the interment being at the same place.

DR. W. HEMAN JACKSON.

Died, on October 23, 1909, at Wellsville, Pa., W. Heman Jackson, D.D.S., in his forty-third year.

Dr. W. Heman Jackson died on October 23, 1909, at Wellsville, Pa. He was the eldest son of Dr. William H. and Mary Hyde Jackson, and was born at Freedom, Cattaraugus county, N. Y., on September 8, 1867. He was educated in the Union School at Springville, N. J., and went to Buffalo in 1887, where for five years he was employed at the East Buffalo Stock-yards as manager. He was a charter member of Company H, Seventy-fourth Regiment, in which he served as a private, corporal, and sergeant.

After leaving Buffalo, he studied dentistry, and was graduated from the Philadelphia Dental College in 1897. Dr. Jackson then took up the practice of dentistry in Galeton, Pa., where he was engaged in successful practice until his death. He was unmarried.

Dr. Jackson was prominent in the affairs of Galeton, and at one time ran for mayor. He was a very skilled amateur photographer, and many of his studies have appeared in journals. He was a Scottish Rite Mason and Noble of the Mystic Shrine, and many friends mourn his untimely loss. Masonic services were held in Galeton, Pa., and interment was made at Sundusky, N. Y.

DR. THOMAS J. JONES.

Died, at his home, Ruthven Lodge, Massachusetts and Wisconsin aves., Washington, D. C., on November 6, 1909, of heart failure, Thos. J. Jones, D.D.S., in his fifty-second year.

Dr. Thomas J. Jones, a well-known dentist of Georgetown and resident of Washington for twenty-eight years, dropped dead of heart failure on the threshold of his home, the historic Ruthven Lodge, Massachusetts and Wisconsin aves., on November 6, 1909.

Dr. Jones was born in Rome, N. Y., in 1857,

but at an early age went with his parents to Oberlin, Ohio, where he attended the public schools. He soon displayed a taste for the study of medicine, which induced his parents to send him to the New York College of Pharmacy, from which he was graduated after taking the full four years' course. Soon after his graduation he moved to Washington, keeping a drug-store for about four years.

While in the drug business, Dr. Jones resolved to become a dentist, and to that end entered the dental department of the National University, from which he was graduated in 1886. Since then he practiced dentistry in Georgetown, with offices at 3104 M st., N. W.

Dr. Jones was married in Washington in 1887, to Louise B. Jones, who together with one daughter, Louise, and two sons, John B. and Paul, survives him.

Dr. Jones was a Past Grand of Covenant Lodge, I. O. O. F., and was also a member of George C. Whiting Lodge, No. 22, F. A. A. M. In both these lodges he was an active worker, and was very popular with his fellow members. He was also a member of the Georgetown Citizens' Association, being a leader in all projects for the improvement of that city.

DR. CHARLES EDWARD DAVIS.

Died, at the Fostoria Hospital, Fostoria, Ohio, of old age, on November 7, 1909, Chas. Edward Davis, D.D.S., in his eightieth year.

Dr. Charles Edward Davis died on November 7, 1909, at the Fostoria Hospital, Fostoria, Ohio, of troubles incident to old age. Dr. Davis was of English and Welsh parentage, being the son of John and Harriet Davis. He was born at Greensboro, Md., November 26, 1829. With his parents he moved to Bucyrus, Ohio, when a boy, and was educated in the school of that village, later being graduated from Columbus Dental College. After his graduation, Dr. Davis went to California in 1856, and practiced dentistry in San Francisco, where he remained until 1869, when he returned to Fostoria to care for his widowed mother. Here he practiced dentistry until his retirement a number of years ago.

Besides being a very skilful practitioner, Dr. Davis took great interest in civic matters, being chief of the fire department for nine years. He was one of the organizers of Trinity Episcopal Church, and was treasurer and member of the vestry.

Dr. Davis was never married, but took the place of father to a number of orphaned nephews and nieces. He had one of the longest Masonic records, serving as secretary of Fostoria Lodge for twenty-two consecutive years.

The funeral was in charge of the Scottish Rite, with Knights Templar and Blue Lodge escort.

DR. A. J. COLLIER.

Died, at his residence, Independence, Kans., October 24, 1909, of tuberculosis, Dr. A. J. Collier.

Dr. A. J. Collier passed away on October 24, 1909, at Independence, Kans., of tuberculosis. The deceased was born in Washington county, Ind., and spent his youth in that community. From there he moved to Paris, Ill., where he took up the practice of dentistry. About the year 1889 he went to Terre Haute, Ind., where he pursued his profession. After his marriage he moved to Sullivan, Ind., where he remained for a number of years, and thence to Independence, Kans., where he had a very successful practice.

Dr. Collier leaves a wife and six children, the oldest of whom, Dr. C. C. Collier, is a surgeon at Chicago, Ill.

MR. EDWARD J. SMITH.

Died, at his home in Beloit, Wis., September 17, 1909, Mr. Edward J. Smith.

Edward J. Smith was long and favorably known as a salesman and dealer in dental supplies. He was born in Norwalk, Conn., September 16, 1814, and had therefore just rounded out a long life of ninety-five years.

He had been attending to business as usual, walking to and from his little dental depot, a mile from home, in the drug-store of his son—and on one occasion during the week climbing the stairs of a nearby building to finish some errand with a local dentist; but a sudden cold developed into pleurisy, and his life-work was ended calmly and peacefully, with messages for his friends and his devoted daughter up to the very last.

He was perhaps the oldest man engaged in

the dental supply business in the United States, and possibly in the world, and in his quiet way was really a remarkable man in many directions, aside from his prolonged years. His life was an active one politically, socially, and in business. He presented an example of right living which, like those of similar men, will not die with him, but will remain for the many who knew him as a benediction and an inspiration.

Brief Necrology.

Dr. Thomas Robinson of Georgetown, Del., August 26, 1909, in his sixty-ninth year, of apoplexy.

Dr. W. A. Leach of Newcomerstown, Ohio, August 27, 1909, in his sixtieth year. Death occurred suddenly, from asthma and heart trouble.

Dr. A. W. Day of Grand Rapids, Mich., August 25, 1909, in his eighty-first year. The deceased was one of the pioneer dentists of Michigan.

Dr. Ernest E. Davis, Chicago, Ill., September 10, 1909, killed by train on the Illinois Central Railroad, while driving from Addison, Ill., to his home in South Elmhurst.

Dr. S. W. Lakin of Lincoln, Nebr., at the home of his sister, Mrs. J. H. Bergen, at Denver, Col., November 20, 1909, of pneumonia. He had practiced dentistry in Eureka, Ill., and Lincoln, Nebr.

Dr. John W. Norman of Lexington, Mich., November 3, 1909, of apoplexy, in his seventy-fifth year. The deceased had practiced dentistry in Lexington for over twenty-five years. He was elected to the state legislature in 1893 and re-elected in 1895.

Dr. John Trimbell Metcalf of 276 Clinton st., Brooklyn, N. Y., October 29, 1909, of old age, in his ninety-first year. He was born in Manhattan in 1818, and had practiced dentistry for fifty years in New York, New Haven, and Brooklyn, being the first president of the New Haven Dental Society.

Dr. W. A. Marler of Hickory, N. C., August 27, 1909, in his sixty-seventh year. The deceased was born in Yadkin county, N. C., served through the civil war in the Confederate army, and then adopted dentistry as his profession, studying in Philadelphia. After being graduated, he began practice in Hickory, N. C.

Dr. Irving J. Wetherbee of Groton and Boston, Mass., October 27, 1909, of appendicitis, in his thirty-fifth year. The deceased was a graduate of and a lecturer at Tufts Dental School, was a member of the National Dental Association, and had made an agreement to practice in London, Eng., for three months of every year.

Dr. Herbert W. Ackermann of Cottageville, S. C., October 24, 1909, of complications arising from typhoid fever, in his twenty-seventh year. He was graduated from the Southern Dental College of Atlanta, Ga., in 1906, was associated for one year with Dr. H. W. Black, Walterboro, S. C., and afterward with Dr. B. G. Willis of Cottageville, S. C.

SOCIETY NOTES AND ANNOUNCEMENTS.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE twenty-eight annual session of the National Association of Dental Examiners will be held at Denver, Colo., on Monday, August 1, 1910, commencing at 10 A.M. Hotel and railroad rates will be given in a later issue.

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

G. V. BLACK DENTAL CLUB OF ST. PAUL.

ANNUAL CLINIC.

THE annual clinic of the G. V. Black Dental Club will be held in the Old Capitol Building, in St. Paul, on February 24 and 25, 1910.

At this writing there is every indication that this will be the largest attended and most interesting of all the clinics which the members have held.

Such well-known men as Drs. Black, Johnson, Friesell, Chappel, Barnes, and Woodbury will take part in the literary program. Operations will be made by Drs. Searl, Gallagher, Carlson, James, Yerke, Crandall, Fawcett, Moyer, Robinson, Clack, Beemer, Richardson, Noyes, Black, Woodbury, Finn, Wallace, Wedelstaedt, and Cooke. There will be operations made with gold and amalgam. Drs. Beemer and Richardson will make and place cast gold inlays.

The table clinics will be of unusual interest. Dr. J. B. Ridout will demonstrate on both days of the clinic. Dr. C. P. Peterson will cast aluminum plates on both days.

Dr. F. B. Kremer will once more assist the members of the club with some things which will be most worthy of attention. Dr. C. L. Topliff will be present, prepared to extract abnormally situated lower third molars.

Dr. E. J. Hart of Madison, Wis., Dr. M. E. Vance of Lincoln, Nebr., Dr. G. F. Hauser of LaCrosse, Wis., Dr. W. W. Wold of Jackson, Minn., Dr. G. J. Couvrette of Grand Forks, N. D., Dr. B. F. Lockwood of Yankton, S. D., will hold table demonstrations which will be of value to all.

It seems only necessary to announce the fact that Dr. C. N. Johnson will hold a table clinic to arouse the interest of his multitude of friends in what he will display.

The number of supply houses which have reserved space is sufficient guarantee that everything which is new and of importance will be on exhibition. The profession generally is invited to attend.

For further information apply to

R. B. WILSON, *Sec'y*,
Amer. Nat'l Bank Bldg., St. Paul, Minn.

CELEBRATION IN HONOR OF DR. G. V. BLACK.

THE Chicago Odontographic Society have arranged for a great meeting, manufacturers' exhibit, clinic, and banquet to be held on Friday and Saturday, January 28 and 29, 1910, and a cordial invitation is hereby extended to all ethical practitioners to be present on these occasions.

Exhibitors' clinic: January 28, 1910, all day, at the Chicago College of Dental Surgery, corner Wood and Harrison sts.

Meeting: January 28th, at 8 P.M. in Handel Hall, 40 E. Randolph st.

Essayist: C. N. Johnson, M.A., L.D.S., D.D.S., subject, "The Selection of Filling Material and Methods of Inserting, when Temporary Work Need Not be Considered." The discussion will be opened by prominent men from all sections of the country.

Clinics: Saturday, January 29th, all day, at the Chicago College of Dental Surgery, by operators of national reputation.

Banquet: As a fitting climax to a great meeting, we will all unite in a testimonial banquet to a great man, whom we all love to honor, Dr. G. V. Black. The banquet will be held in the Gold-room of the Congress Hotel, on Saturday evening, January 29th, at 7 o'clock.

Information regarding meeting or banquet will be furnished by any officer of the society or by addressing

GEO. N. WEST, *Chairman*,
100 State st., Chicago.
H. N. ORR,
A. F. JAMES,
J. E. SCHAEFER,
C. M. CAHILL,
Clinic Committee.

NETHERLANDS—NEW DENTAL SOCIETY.

DURING the month of November there was organized in Amsterdam a new dental society, entitled Nederlandsche Vereeniging voor Tandheelkundige Orthopaedie (National Society for Dental Orthopedia). The following officers were elected: Dr. L. Frank, Rotterdam, president; Dr. I. J. E. DeVries, Amsterdam, secretary; Dr. P. J. J. Coebergh, Utrecht, treasurer.

I. J. E. DEVRIES, *Sec'y.*

NATIONAL DENTAL ASSOCIATION—SOUTHERN BRANCH AND THE TEXAS STATE DENTAL ASSOCIATION.

THE thirteenth annual meeting of the Southern Branch of the National Dental Association will be held in Houston, Texas, Wednesday, May 11, to Saturday, May 14, 1910.

The association has accepted the invitation of the Texas State Dental Association to met conjointly with them and as their guests.

The officers and members are actively at work, and a most instructive program is being arranged. A preliminary program will be announced later.

CARROLL H. FRINK, *Recording Sec'y*,
301 Masonic Temple, Jacksonville, Fla.

DENTAL INDEX BUREAU

UNDER THE AUSPICES OF THE

NATIONAL ASSOCIATION OF DENTAL PEDAGOGICS.

THE following matter has been issued in the form of a circular justly purporting to be "of especial interest to students, writers, publishers, editors, librarians, colleges, dental societies, etc." It is described as—

A PLAN BY WHICH SUBSCRIBERS WILL BE FURNISHED A CLASSIFIED CARD INDEX OF ARTICLES IN THE LEADING DENTAL JOURNALS.

At a meeting of the National Institute of Dental Pedagogics, held in St. Louis last December, a committee was appointed to establish a Dental Index Bureau. Briefly stated, it is intended that this committee shall employ a competent person to review and classify all of the articles in ten or twelve of our leading dental journals, and shall furnish to each of the subscribers to the Bureau, at frequent intervals, cards so classified and grouped that the subscriber may easily and quickly find all the articles on any subject in dentistry. These cards will be made on a definite system, by which additional cards may be added as they are received and always go to their proper places; so that no matter how many additions may be made from year to year, all of the cards on each subject will be in a separate group. For example, all of the articles on the subject of filling teeth with gold will be in one group, all on filling teeth with amalgam in another, all on cavity preparation in another, all on alveolar abscess in another, etc.

It is hardly necessary to mention the value of such an index to the wide-awake members of the profession. Journals which may have accumulated, and which are now almost worthless on account of the difficulty in finding articles when desired, will become of service as the index is extended to cover them. The man who has occasion to look up a particular subject, or to write a paper, can find all that has been written on that subject instantly. The grouping of articles on each subject enables one to bring together the views of many writers. Post-graduate courses of study can be instituted by dental societies or undertaken by individuals; the ready reference index will make college libraries of the greatest value to the faculty and to the student body; editors and writers will find their work facilitated, and the results of their study more gratifying to themselves and more highly appreciated by their readers.

The idea of the committee is to organize a permanent society for the purpose of classifying and indexing all dental literature. The present plan is but preliminary to the greater work, which will cost less and less to individual subscribers as the number of members is increased. . . .

The subject-matter of several of the leading dental journals has already been classified and indexed by Dr. Arthur D. Black, at a great expenditure of time and money. This index contains about 40,000 cards, cataloging articles in various journals from 1839 to date; but it is not available, for obvious reasons, to the profession at large. Your committee is privileged to copy these cards, should the funds subscribed permit, which would be of great benefit to the subscribers and incidentally to the whole profession.

It is the committee's intention to this year furnish each subscriber with author and subject cards for all original articles, papers read before societies, book reviews, and editorials, in about ten journals for 1908 and 1909—from 4000 to 5000 cards, all properly arranged with all cards for each subject together, with guide cards for each subject and with author cards arranged alphabetically. It is expected that in 1910 the cards will be furnished for the same journals for the years 1907 and 1910; and in 1911 cards for 1906 and 1911. Thus in three years each subscriber will receive cards for these journals for six years—probably 25,000 to 30,000 cards. These cards will be sent in boxes in which they may be kept permanently. The number of journals indexed and the number of cards sent out by the committee, however, will depend upon the number of subscribers.

The preliminary report of this committee, which was made at the St. Louis meeting, gives an outline of the plan. It will be noticed that it is the intention to try this plan for a period of three years, and subscriptions at the rate of Twenty-five Dollars ($25.00) a year for that period may be sent to any member of the committee.

Subscriptions will be received from individuals, dental journals, dental schools, or dental societies. Any person or group of persons may send in a single subscription, and one set of cards will be sent in return. Subscription blanks may be had from any member of the committee.

Committee for 1909—Dr. W. L. Fickes, *Chairman*, 6200 Penn ave., Pittsburg, Pa.; Dr. Arthur D. Black, 31 Washington st., Chicago, Ill.; Dr. Herman Prinz, 603 Century Bldg., St. Louis, Mo.

REPORT of the Committee on Classifying and Indexing Dental Literature, to the Institute of Dental Pedagogics, at the annual meeting, St. Louis, 1908–1909.

The undersigned committee, appointed by the Institute of Dental Pedagogics for the purpose of devising ways and means of classifying and indexing current dental literature, as an evidence of progress presents to the members of the Institute and others interested the following plan:

1. That the subscribers to this plan organize themselves into an association to be known as The Dental Index Bureau.

2. That the above-mentioned committee, appointed by the Institute, will devise ways and means for carrying out the work of the Bureau during the coming year, and will call a meeting at the time and place of the next meeting of the Institute, for the perfecting of a permanent organization.

3. That this committee will employ a competent person to classify as much of the current dental literature as possible, beginning with January 1909 journals, and will furnish subscribers, at frequent intervals, with author and subject cards of all articles classified.

4. That this committee will be guided by a vote of the subscribers in the selection of the literature to be classified.

5. If the funds subscribed will permit, as much as possible of the literature of previous years will be similarly classified and indexed.

W. L. FICKES, *Chairman*,
ARTHUR D. BLACK,
HERMAN PRINZ.

THE TRUMAN DINNER.

CLASS OF '85, DENTAL DEPT. UNIV. PA.

ON Saturday evening, January 22d, a complimentary dinner will be given to Prof. Jas. Truman, at the Waldorf Astoria, New York city. All members of the class of '85 who can possibly attend should do so, as this is the twenty-fifth year of our graduation, under our beloved professor and the secretary of the faculty.

Those who expect to attend will send check to Dr. S. G. Perry, treasurer, 130 West 57th st., and send me a postal so that I may arrange to have our class seated together.

JOHN A. SCHMIDT,
Member Exec. Com. Truman Dinner,
1195 Dean st., Brooklyn, N. Y.

MARQUETTE UNIVERSITY, DENTAL DEPARTMENT.

ALUMNI ASSOCIATION.

THE fourth annual clinic and manufacturers' and dealers' exhibit of the Alumni Association, Dental Department Marquette University, will be held in the Milwaukee Auditorium, Milwaukee, Wis., January 18 and 19, 1910.

Every effort is being made to make this the most successful and interesting meeting of our society. Men of national reputation will give clinics.

All ethical practitioners are cordially invited to attend.

W. F. STRAUB, *Sec'y*,
721 Third st., Milwaukee, Wis.

IOWA STATE DENTAL SOCIETY.

THE forty-eighth annual meeting of the Iowa State Dental Society will be held at Des Moines, May 3, 4, and 5, 1910. Besides an especially strong program, plans are being made for a large dental manufacturers' exhibit. Display space free of charge.

W. G. CRANDALL, *Sec'y*,
Spencer, Iowa.

MISSISSIPPI DENTAL ASSOCIATION.

THE seventeenth annual meeting of the Mississippi Dental Association will be held in Jackson, in the Senate Chamber of the Capitol, May 24 to 26, 1910. All ethical dentists are invited.

L. B. PRICE, *Sec'y*,
Corinth, Miss.

ODONTOLOGICAL SOCIETY OF CHICAGO.

THE following officers were elected at the annual meeting of the Odontological Society of Chicago, held Tuesday evening, November 2, 1909: Dr. W. V-B. Ames, president; Dr. C. N. Johnson, vice-president; Dr. L. L. Davis, secretary and treasurer; Dr. J. H. Worley, curator; Dr. E. A. Royce, member of Board of Censors.

L. L. DAVIS, *Sec'y*.

VERMONT AND NEW HAMPSHIRE DENTAL SOCIETIES.

JOINT MEETING.

THE Vermont and New Hampshire Dental Societies will hold a joint meeting at Rutland, Vt., May 17 to 20, 1910.

HARRY F. HAMILTON, *Sec'y*,
Newport, Vt.

HAWAII BOARD OF EXAMINERS.

THE next meeting of the Board of Dental Examiners for the Territory of Hawaii will be held on Saturday, January 22, 1910, at Honolulu.

A. J. DERBY, *President*,
C. B. HIGH, *Secretary-Treasurer*.

INDIANA BOARD OF EXAMINERS.

THE next meeting of the Indiana State Board of Dental Examiners will be held in the State-house, Indianapolis, January 10 to 14, 1910. All applicants for registration in Indiana will be examined at this time. For further information address

F. R. HENSHAW, *Sec'y*,
507 Pythian Bldg., Indianapolis.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS.

The Board of Dental Examiners for the District of Columbia will hold their semi-annual examination January 3 to 5, 1910. Applicants for examination must file applications, accompanied by fee of $10.00 and photograph, with the secretary at least ten days before the date of examination.

CHAS. W. CUTHBERTSON, *Sec'y*,
309 Seventh st., N. W., Washington, D. C.

SOUTH DAKOTA BOARD OF EXAMINERS.

THE South Dakota State Board of Dental Examiners will hold its next regular meeting at Sioux Falls, S. D., January 11, 1910, at 1.30 P.M., and continue three days. All candidates are required to take both practical and theoretical examination. The fee of twenty-five dollars, together with application, must positively be in the hands of the secretary not later than January 2d, otherwise

the applicant will not be entitled to take the examination.

G. W. Collins, *Sec'y*,
Vermilion, S. D.

IOWA BOARD OF EXAMINERS.

The Iowa State Board of Dental Examiners will hold a meeting for the examination of candidates for license to practice dentistry in Iowa, beginning January 10, 1910, at 9 A.M., in Des Moines.

For blanks and other information write

E. D. Brower, *Sec'y*,
Le Mars, Iowa.

ARMY DENTAL CORPS.

Report of changes of stations and duties of dental surgeons, U. S. army:

Harold O. Scott, on expiration of present leave, will proceed to Columbus Barracks, Ohio, for duty, relieving Dental Surg. Rex. H. Rhoades, who will proceed to San Francisco and take transport about February 5, 1910, for Philippine Islands, for duty. (November 16th, W. D.)

John S. Marshall, examining and supervising dental surgeon, is granted leave for three months, upon his relief from duty in the Philippines. (November 17th, W. D.)

Raymond E. Ingalls, from duty in the Philippines, to sail from Manila about February 15, 1910, to San Francisco, for further orders. (November 17th, W. D.)

For the week ending December 18, 1909:

Robert T. Oliver, examining and supervising dental surgeon: Ordered to Fort Hancock, N. J., for duty.

Alden Carpenter: Ordered to proceed to Fort Ethan Allen, Vt., for temporary duty.

George D. Graham: Ordered to Fort Leavenworth, Kansas, for duty.

Alden Carpenter: Ordered to West Point, N. Y., for duty.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING NOVEMBER 1909

November 2.

No. 938,525, to B. E. Turney. Electric mouth-mirror.

No. 938,544, to Wm. Ball. Hypodermic syringe.

No. 938,597, to Rodolfo Lombardo. Hypodermic syringe.

No. 938,640, to Edward L. Chott. Dental instrument.

No. 938,951, to F. D. Bell. Hypodermic syringe.

November 9.

No. 939,261, to F. O. Jaques. Machine for contouring crown matrices.

No. 939,365, to Chas. Wiethoff. Dental-instrument sharpener.

No. 939,476, to Benj. F. Copp. Dental inlay holder.

No. 939,655, to James, Alfred and Joseph Barker. Head-rest.

No. 939,834, to George A. Harper. Dental tooth-clamp.

November 16.

No. 940,058, to Samuel Quigley. Root-trimmer.

No. 940,351, to Otto Neugebauer. Spatula.

No. 940,599, to James Humphrey. Suction-chamber former.

November 23.

No. 940,831, to David Stern. Aseptic lamp.

No. 941,149, to David D. Hyman. Suction plate.

No. 941,200, to Wm. D. Jones. Antiseptic tooth-brush holder.

No. 941,253, to John Hood. Mercury dispenser.

November 30.

No. 941,612, to Arthur W. Browne. Handpiece swivels.

No. 941,718, to Mary R. Koons. Instrument holder.

No. 941,840, to Julius Aderer. Tooth-regulating device.

THE

DENTAL COSMOS.

VOL. LII. FEBRUARY 1910. No. 2.

ORIGINAL COMMUNICATIONS.

ETHICS.

By SAFFORD G. PERRY, D.D.S., New York, N. Y.

(Read before the First Dental District Society of the State of New York, at its regular monthly meeting, October 1909.)

A COMPREHENSIVE study of ethics implies a partial study of the evolution of the human mind. If it is true that humanity represents an evolution from the simple to the more complex, then it must be true that ethical advancement has followed the same lines of gradual development.

When man was a barbarian, dominated solely by primitive instincts, it is safe to say he was innocent of ethical perceptions, and unchecked by ethical restraints. The higher he has climbed in the scale of existence, the more clearly has he perceived that ethics is an outgrowth of his higher nature, and as indispensable to the health of his soul as are air and food to his physical welfare. It follows from this that before the time when man felt the need of social conditions he was without ethical instincts.

DEFINITION OF ETHICS.

The word *ethics* is derived from the Greek, and denotes an attribute of the human mind. The Standard dictionary's definition is, the "science of human duty." An eminent writer, Professor Birks, considers it the "science of ideal humanity." The Century dictionary's definition is, the "doctrine of man's duty to himself and the rights of others." The Encyclopedia Britannica defines ethics as follows: "Physics is concerned with what is, what has been, and what will be; ethics with what is 'good' or 'what ought to be.'" This is qualified by saying "what is good for man," to distinguish it from "absolute good," which is the subject-matter of theology.

Along the ages different definitions have been given, dependent upon the civilization of the different periods. Socrates and Plato held practically the same ideas in reference to ethics, claiming the most important possession of man to be wisdom, or knowledge, and the most important knowledge to be knowledge of the good. Plato extended this somewhat by saying the good and the beautiful. Aristotle in the Ethics, with good com-

mon sense, held that "good is a golden mean between two evils."

The Roman Emperor, Marcus Aurelius, though a stoic philosopher and a persecutor of the Christians of the second century, a man of austere justice yet of Christian gentleness, taught that "whatsoever any man doeth or saith, thou must be good; not for any man's sake, but for thine own nature's sake."

Herbert Spencer, in "Social Statics," defines ethics in terms of human rights and human liberties, as follows: "Human happiness is the divine idea; human happiness consists in the exercise of the faculties, and the ethical or moral law allows full and free exercise of all the faculties, provided such exercise does not interfere with the same full and free exercise of all the faculties on the part of everybody else." At first this may seem like a license to do as one pleases, but on careful study it will be found as exacting as the Sermon on the Mount, of which it is a scientific parallel. It has not the exquisite softness and appealing human quality of that sublime statement, but it teaches the same inexorable lesson.

If before looking up the subject I had ventured a definition of my own, it would have been, the doctrine of unselfishness. But it is evident that that is not comprehensive, though it defines one phase of the subject which I want to emphasize. As man was dominated by selfish instincts at the very dawn of civilization, so is he often now, at the midday of human progress, lifted by unselfishness to the company of the angels themselves. No other examples need to be cited than the great charities, the great hospitals, and the great free libraries of the world, to show this.

Spencer's code is an ethical embodiment of the very highest to which man has yet attained. Its realization in practical life would be the discovery of heaven on earth! Evil would disappear and Plato's dream of the good and the beautiful would at last be realized. Following this as a guide, we would be as free as the wind that blows, so long as we made no one unhappy. It would insure universal politeness, for the first principle of true politeness is to make other people happy. It would improve the manners of every community, for nothing would be permitted that could cause unhappiness.

President Butler of Columbia has said: "If the decent men and women of America would begin tomorrow to do the things which their private beliefs and public professions require, the sum total of the world's comfort and happiness would be marvelously increased before sunset." If such a code of ethics were established, it would control the least important, as well as the most important affairs of life. It would affect our every action, and I could easily enumerate an appalling number of daily habits among even the best of us that spring from selfish motives, but pass unnoticed because we are so accustomed to them.

But such examples would be out of place here, though a flash-light thrown on them might make us more fully realize how long it must yet be before Spencer's code of ethics becomes woven into the texture of our modern life. It is not well to dwell upon our foibles and our weaknesses. It is better to fix our minds upon the fine things that have come to us in this modern day, and to feel the uplift that must result from a serious study of our surroundings.

THE EVOLUTION OF ETHICS.

A study of the history of ethics clearly shows the increasing importance of ethical elements as the centuries unroll. As the human conscience becomes more sensitive and more potent, so does the subject of ethics become a more important factor in human affairs.

We can easily believe that in the earlier civilizations individual man was more a unit and less related than in the complex civilization of the present day. In one sense he had more freedom, and was less bound by ethical ties. Today he is surrounded by a network of complicated conditions, and is met at every turn by ethical considerations that cannot be evaded. The Standard dictionary's definition of ethics—the science of human

duty—is a fair one; man is no longer a free agent, but is surrounded by conditions from which he can no more escape than from the law of gravitation. But as this ethical restraint curbs him and compels him to have regard for the rights of his neighbor, so does it entitle him to the same respect from his neighbor, and to the same happiness in his social relations.

In fact, our modern life is possible only because it is ethical. Faith in each other is the ethical quality that binds us together and keeps us going. The time for distrust of each other is passing away. One need not have the prophetic instinct to know that in time it will be gone forever. All the high places of learning are bound by the indissoluble bonds of ethics. All the liberal professions are protected and strengthened by ethics, unwritten though their codes may be. Even the labyrinths of finance and commerce are illuminated by its steady light. During the last panic a "gentlemen's agreement" was as binding as a written law, and was said to have helped to save the financial situation at a critical moment.

If this line of reasoning is correct, and if it is true that we must have regard for ethical conditions at every turn, it remains for us to see if we can arrive at a still clearer definition—that is, find a standard by which we can determine what is truly ethical and what is not.

THE GREATEST ETHICAL CODES.

The hasty semi-historical sketch I have given concerned the philosophical and partially scientific side of the question. I omitted the religious side, because an impartial study of the subject must convince one that ethics is something that is common to all religions, and yet larger, in a certain way, than any one religion. The greatest philosophical writers of the world, both ancient and modern, have found in ethics a most congenial subject. The founders of the great religions have embodied ethical teachings, but, perhaps with the exception of Confucius, have subordinated ethical considerations to the emotional and devotional sides of their systems. The religion of Confucius has been called the great ethical religion of the world, and it is the one religion that antedates Christianity in formulating the golden rule. But it was Christianity that made prominent the golden rule, crystallizing about it, as the most precious religious precept the world has yet known.

In the golden rule we shall find the final test to which all our ethical questions must be subjected. It is very convincing and very consoling to find so sure a test, and it is still more convincing when we remember that our scientific and philosophical studies led us to accept Herbert Spencer's dictum as the most satisfactory of all non-religious writers, and to find that his code of ethics comes so near to the golden rule as to be practically the same thing. His code may be considered negative, because it affirms that no one shall be made unhappy, while Christianity is affirmative, declaring that everybody shall be made happy.

Surely we need look no farther for a sure criterion by which to gage all human actions! If any further test is required it will be found in the depths of every sound and honest human heart. All that has gone before in the long effort which man has made to reach a full understanding of what is right has conspired to make it clear, at last, that to treat his brother as he would have his brother treat him is to have found the answer that meets all the conditions, now and to the end of time—which is truly the doctrine of unselfishness.

One needs but little learning to know all this. It is not necessary to be able to read and write and cipher to understand the everlasting truth of this divine proposition. With this shining motto how easy our lives become! Never for a moment need we be in doubt as to how we shall act toward our fellow man. It is as if God, to save our time, and keep us from worry and doubt, had implanted in our hearts this sure guide!

We need not stop to consult a friend or a book—as quick as God's lightning we can decide, and decide rightly every time! All the written laws of all the

ages past converge in this final law—which need not be written to be understood.

A long essay might here be written to show how unqualifiedly the modern Christian world accepts the doctrine of the Sermon on the Mount, and yet how inconsistently in its failure to live up to its simple requirements. But all religions embody precepts in advance of the capacities of their adherents, just as all along the ages the different codes of ethics have been on a higher plane than was the average civilization of the period when they were promulgated.

We know, of course that the world is not ready for the acceptance of Spencer's code of ethics any more than it is ready for the idealism of Christianity. We admire the beautiful doctrine of giving away all that we have, but we do not practice it. In no Christian country that I have ever heard of is the Sermon on the Mount accepted literally. In the same way the most advanced and ethical people to be found in the world do not, and really cannot, live up to the high standard of Spencer's code.

Humanity is not yet ready for such exalted altruism. But this fact does not invalidate the ethical or the religious code. Spencer himself says that because a Congo Bushman can count no farther than three, it does not follow that there is no established system of arithmetic. There is something in the sane human mind that compels the acceptance of the logic of the Spencerian code of ethics, just as there is something in the structure of the human heart that impels the acceptance of the exalted idealism of Christianity.

Once a man feels the truth of this, he is equipped for whatever the lottery of life may bring to him. We must hold to high ideals. Only in this way can we come to feel that this life is worth living. Some are born in fair weather and under favoring skies, and live ethically as easily as a sparkling trout-brook runs downhill. Others come into the world when it storms, and live their unethical lives through stress and strain to the very end.

ETHICS AS APPLIED TO DENTISTRY.

It seems to me that this is all so clear that it will be almost a waste of time to make the application of it to our profession. And yet I think there are some things that ought to be said in relation to our professional associations with one another, and particularly some things that should be said in relation to the attitude of patients toward their professional advisers.

In the early days of our profession it was the habit of our leading societies to print, in conjunction with their constitutions and by-laws, carefully formulated codes of ethics. Such codes were intended for the enlightenment of members as to their duties, and as a guide in the trial of anyone accused of unprofessional conduct. In the formative stage of any new profession such a printed code may be necessary. In fact, many will argue that a printed code should be retained as a reference document, just as a lease is signed and a copy given to each party interested.

For many years my own feeling has been not in favor of a printed code, because it has seemed to me that all right-thinking and right-feeling members of our profession carry the code of ethics in their own hearts, and do not need to consult the printed page, and that those who are not yet developed to an appreciation of the beauty and the binding force of ethics would not be enlightened or restrained by a printed code.

I shall not take a decided stand on this question. There are so many forcible arguments in favor of a printed code that one may well be in doubt. The object of this paper is not the advocacy or the rejection of a printed code. It is written for the purpose of asking for a keener appreciation and a closer observance of the spirit of ethics, written or unwritten. It is written in the hope that while we are carried away with wild enthusiasm over our new discoveries and intoxicated with the success of our new inventions and our new processes, we shall not forget the one most beautiful accom-

paniment of all this progress—its ethical relations.

England in her pride of empire and her lust of power has had, in the last generation, no more salutary suggestion than that conveyed by Kipling in his poem "Lest We Forget."

ETHICS AS A PROFESSIONAL MAN'S NATURAL DUTY.

If there is and must be in the general affairs of modern life a keen appreciation of ethical conditions, there should be in professional life a still keener appreciation of them. There are several important reasons why this is true.

In the first place, professional men in our day are highly educated, and while, as before stated, education is not necessary to an understanding of ethics, yet I presume no one will contend that a high degree of education does not elevate and refine and make more clear all intellectual processes, as well as render all qualities of the heart more tender.

But more important, it seems to me, than all this is the fact that, while professional life is a business that must conform to business principles, at the same time it has evolved to a point beyond the strict limitations of the so-called business world. For instance, a man can sell a pound of tea or a plot of land, which are concrete substances that can be weighed and measured and have established market value. But who can weigh or measure the services of a professional man? A professional service is a personal service that is the opposite of a concrete fact, and who can appraise it so justly as the professional man who renders it? The person who receives it may be entitled to a voice in estimating it, but that person is not fitted by training and experience to as justly estimate it as the man whose life has been spent in fitting himself to render such service.

Therefore, while business principles must remain a factor, at the same time the personal relation is such that a chivalrous condition is established, and the professional man is placed upon his honor not only in the matter of rendering a just charge, which is, after all, a small matter compared to the obligation of rendering a wise service. From this it naturally follows that the very highest expression of ethics is involved in the relation between a professional man and any and every one who receives his services.

All the ages combined have produced no more chivalrous and exalted relationship than this. To a highly organized, sensitive nature there is no relationship more binding than this. The unwritten law of usage or the formal written law of the land must always be secondary to this sacred relationship.

This, of course, has been expressed innumerable times in the adopted codes of ethics in the various departments of professional life. That its spirit is not always followed must be chargeable to the fact that not even yet has humanity advanced to that point where its beauty is deeply felt and its binding force gladly acknowledged.

RECIPROCAL ETHICAL RELATIONSHIP BETWEEN PRACTITIONER AND PATIENT.

And just here I wish to say what, as far as I know, has not been said before with special force. I refer to the reciprocal relationship that should be maintained on the part of anyone who receives and benefits by a professional service. Perhaps it is too much to expect that those who receive professional services be equipped to fully appreciate the ethical obligations that should exist toward those who render them professional services.

I have not now in mind those only who receive professional services in all the different specialties of medicine, but also those who are benefited by the advances made in all the different departments of learning, as in law, theology, the mechanic arts, and the whole range of the fine arts. It seems to me that in this country there is comparatively little appreciation of the real beauty and the real value of special acquirements, as well as of knowledge in general.

This statement may not carry conviction to the minds of all; but I am per-

suaded that in this new country, where the effort has been to subjugate nature, where intense activities have been devoted to commerce, to industrial pursuits, and to the general acquirement of money, there has not been time for such an appreciation of what I will call the finer things of life as exists in the old world.

It is notorious that in Europe a man who has spent a lifetime in gaining experience in any special department of knowledge is secure in his position, and can depend upon the permanent appreciation and the lasting loyalty of those who have benefited by his ministration. That is not the case in the same degree in this country. Madame Urso, the distinguished violinist, told me in a tone of mingled pride and sadness that in Europe she was sure of her following even after long years of absence, while here she was thoughtlessly pushed aside at any time to make way for some new aspirant, whose greatest claim was that of being new and novel! It was not because the new-comers had more ability, for by common consent of those most competent to judge she was acknowledged to be one of the most distinguished artists in her line the world has ever known.

Her explanation was that as a people we are restless and crave novelty, and are ready to follow the latest fad. The truth of this is exemplified every season in the musical, dramatic, and literary world. One sensation is no sooner over than another one is looked for. The art of talking through the air by "wireless" is no sooner acquired than flying through the air follows, and those marvels are forgotten the moment the discovery of the North Pole is announced. And following that double announcement, there is a display of the absence of ethics that almost invalidates the claim that I have made that the world is growing more ethical as it grows wiser.

THE PATIENT'S LOYALTY AN ETHICAL DUTY.

In our own profession the absence of loyalty on the part of our patients is a matter of rather common observation. As I said before, it is perhaps too much to expect them to have as keen an appreciation of ethics as we are supposed to have. They are not specially educated as we are, and it does not occur to them, once their bills are paid, that they are still under obligations to us, no matter how long or how strenuously we have cared for them. They go from one practitioner to another, giving the matter no thought, but, following the restless spirit of the age, they seek the practitioner who can talk most glibly of things that are new, or whose office is filled with impressive appliances that shine with dazzling brilliance, and convey the idea of progressive practice! In their search for cleanliness and sanitation they forget that honesty, a level head, and long experience are quite as important.

If we were as unethical with each other as some of our patients are with us, we would have reason to feel depressed and discouraged. I fear there is no help for this. It is one of the penalties we must pay for living at this time. In future ages our descendants may fare better. The public will then be better educated and have a more tender conscience. For the present the redeeming feature is that a man of spirit can have no desire to retain any patient who does not prefer to remain under his care.

Of course, all patients have the right to seek the services of those who are agreeable to them, and who can command their confidence. No practitioner can have any lasting claim upon any of his patients. My allusions have been to those only who float about from one practitioner to another without any sufficient cause.

The fact is, that one who is successful in practice will have but little to complain of in this respect. The delicate consideration and the stanch loyalty of most of our patients is the most precious reward that can come to a professional man. It cannot be measured by any concrete scale. It is a spiritual reward that cannot be described. It touches the heart, and lifts it above the thought of material things. If it is true that we really live only in the spirit, then it must

be that only as we are ethical can we know the fulness of life.

ETHICAL RELATIONSHIP BETWEEN PRACTITIONERS OF THE SAME PROFESSION.

I come now to the consideration of ethical conditions as they should exist among practitioners of the same profession, including, of course, those of nearly related professions. If my line of reasoning has been sound, and all that I have said in relation to ethics is true, it seems to me that the application to the individual members of our specialty is very easily made.

That there should be a distinct understanding as to the definition and the binding force of ethics is self-evident. If the application of the precepts of the Sermon on the Mount gives us the true test of what is ethical, it seems to me, as I said before, that we shall all find an instantaneous guide for all our actions toward each other. Since a careful study of Spencer's code of ethics brings us to the same conclusions, it is evident that we are on unassailable ground. An essay like this is wasted if it cannot help us to obtain a clear perception of our duty to each other.

DENTAL ETHICAL CODES.

It is curious to note the analogy in the development of society at large and that of a new profession in particular. In each case ethics becomes more essential as development advances.

In the early days of our profession the ethical relations between operator and patient were the same as today. There was, or should have been, the same trust on the part of the patient and the same chivalrous devotion on the part of the operator; but today the relations between members of our profession are more complicated. When dentistry first developed in the direction of a distinct profession, the average dentist did everything that was needed in his patient's mouth. He did not therefore come into very close relations with his fellow practitioners. Today dental practice is divided into so many specialties that every practitioner is brought more closely in contact with his fellow workers. The need, therefore, for a clear understanding of ethics is greater than ever before.

ETHICS AS INFLUENCED BY SPECIALIZATION.

Specialization is an inevitable accompaniment of evolution. It is certain that in the future there will be even a greater exchange of patients than at the present time. This will involve a closer regard for ethical conditions.

A short time before his death, Dr. Northrop, with characteristic common sense, said to me that hereafter it will be harder to practice dentistry than it was in the past. I assented to this as he meant it, which was that our profession at the present time is still lamentably unethical. But I did not agree that it would be so in the future; I contended that practice will be easier, just because it will be more specialized, and I predicted that ethical conditions will exist as they will be needed, for, with Emerson, I believe that civilization carries with it its own cure.

While there are many in our profession who are thoughtless and careless in matters of ethics, and some who are born unethical and can never be different, yet I believe the vast majority is ethically as advanced as any class of men on earth. All that is needed to increase this majority is to make more clear the irresistible and inevitable need of more perfect ethical conditions.

As we trust each other more, and are more worthy of each other's trust, there will be more specialists and a greater exchange of patients, and then the practice of dentistry will be easier than it is today. Selfishness and self-seeking must still exist in our profession, as in all others. It is a part of the game, but it always loses when the game is played to the finish.

Marcus Aurelius was right when he said: "Be ethical for your own nature's sake!" If we do the right thing, we can afford to let the other fellow do the wrong

thing. If we are selfish in this, it is the selfishness of self-preservation, and that has always been accepted as justifiable ethically.

ETHICS AND ORTHODONTIA.

Perhaps in no subdivision of our professional work is there as great need of ethical conditions as in the very recently established specialty of orthodontia. If the need of such a specialty is granted—and I think it generally is—a complex ethical condition at once is established.

The general practitioner, who naturally has the care of the children of a family from the first moment of need, is under obligation to keep a close watch over the development of the young teeth. This watchfulness is a sacred duty, and one that is due the parents who trust him. In the early days the attention was focused on the subject of saving teeth from decay. At the present time, assuming that these teeth can be saved, a further step in professional development has been taken, and the need of regularity of position is more fully realized. This brings to the general practitioner a new obligation, which is, that the teeth must be "regulated" if they are out of proper position; and if he is not equipped to do this work well, it is his duty to find someone who is. Nothing less than this will meet the ethical demands of the parents, and satisfy his own conscience.

If he is well equipped and has no dislike of this work, he does wrong to send it to a specialist, because, other things being equal, he is better able to judge wisely as to the proper treatment to be adopted, since he has seen the teeth develop from infancy, and the benefits of this long experience are due to his patients. Also, if possible, the patient should be saved the annoyance of going to a stranger.

The young graduate who adopts orthodontia as a specialty is handicapped because of the lack of this long experience, and is in danger of trying to regulate many young teeth that should be left to fall in line through the process of natural development.

REFERRING PATIENTS TO SPECIALISTS.

Although specialties in all departments are inevitable and invaluable, there is a certain dangerous bias in all of them—the danger of seeing a subject only from the specialist's standpoint. If the general practitioner can safeguard his patient against this danger, it is his duty to do so; but he has no ethical right unless he can substitute a wiser treatment. If he is not equipped for the work, he must find someone who is—and then another ethical condition arises which is as binding as any that has gone before. It would be even more binding if it were possible to make a distinction in ethics, which I doubt. I refer, of course, to the ethical obligation incurred by the specialist to whom the patient may be sent; his obligation will be at once a double one, first to the patient, and second to the practitioner who sent the patient. To the first he must give his best service, and to the second his best wishes and a punctilious return of the patient after the work is completed.

The specialist will have the harder task, because he must have the ability which he claims, and must do his work under the eyes of God and man. The practitioner's task has been easier, because it has been under the eyes of God alone—of course we know the eyes of God are more ready to overlook our faults than are the eyes of man. If both, practitioner and specialist, have deep in their inmost hearts the real good of the patient and but little thought of their own interests, there will be no need of any eyes watching over either of them, and the whole question will be settled to the happiness of the three parties involved. Ethical relations between men are as easy as is sliding down-hill when they all do the right thing.

If a patient is unethical enough to leave a regular practitioner and go to a specialist on the sly, the specialist will be on unassailable ground if he says that he will only undertake the case with the knowledge and consent of the regular practitioner. He need not know who the practitioner is—in fact it will be better

for him if he does not know, as the impersonal attitude gives him command of the situation. The practitioner can find no fault with this, but, instead, must respect and admire the specialist even more than before. This manly action should lead to a closer friendship between the two. In this event there has been only one unethical action, and the practitioner has a grievance against the patient only. If the specialist accepts the patient on the sly, there will be two unethical actions and two grievances.

The practitioner may keenly feel the unethical action of his patient, but he should be charitable and remember that his patient has not been trained in ethics. Besides, it may happen that the patient goes to the specialist on the sly because of fear of hurting the feelings of the practitioner. The specialist who has been trained in ethics need not expect this charity if he accepts the patient on the sly. It is impossible to conceive of any complications that cannot be easily settled, if both parties are ethical.

How easily the wheels of life go round, and how friendships multiply when men are "square" with each other. It will be a happy day for the public, and, I contend, an easier one for our profession, when even more specialties are established. But let them all be kept under the wing of the mother profession! We are all in the same boat and sailing for the same port, and it is foolish—even wicked—for any of us to become cranky and jump overboard and try to swim toward the same harbor. According to Spencer's code this is wicked, because it makes those who stay in the boat unhappy over such an exhibition of foolishness. Besides, if a storm comes up, it is safer for all to remain together, because those who jumped out could have helped at the oars! It is safer in the boat than in the water, and I should think it would be more agreeable. *Camaraderie* is a natural outgrowth of ethics.

Although our profession is a new one, it has made rapid strides in all that constitutes true professional worth, and it has ministered so well to the needs of humanity that it has a secure place in the estimation of the public. It will be wise for us to hold together and be therefore more worthy of that esteem. Nothing will ever help us all so much to be ethical as to strive for the real good of our patients. And herein lies the easy solution of the whole question. The old Psalmist hit the mark when he said, "Not what I will, but what Thou wilt, O Lord!"

RECEIVING NEW PATIENTS.

There is perhaps no question in ethics more delicate and more difficult to decide than the proper course to be pursued in receiving new patients. In a large city like New York it frequently happens that patients from other cities need attention. They are sometimes sent by their friends, and sometimes by their home dentist. It is easy to decide in all such cases, the proper course being to make the patient comfortable and safe until a return home is possible; to do more than this is an injustice to the home dentist. In the whole course of my professional life nothing has ever given me more pleasure than to render such temporary service, and without making a charge, unless the operation was so large that the patient would be made unhappy by persistence in such a course.

The same holds true in the case of any city patients whose dentist is away, or is ill. To give careful treatment and return such a patient promptly should afford the keenest pleasure.

The matter of accepting patients for permanent care is a very different thing, and is not so easily settled. Perhaps I can discuss this phase of the subject in no more effective way than to describe the course I aim to pursue in such cases.

In the early days of my practice I thought it was proper, when a new patient appeared requesting treatment, to inquire who had been the patient's adviser. This course was pursued for many years. I presume I was influenced in this by the example of strong men like Atkinson, who would not hesitate to ask almost any question of any patient. I met with so many refusals to answer this question, and was so often made to feel

that it was an impertinence to ask it, that in time I began to question my right to do so. Finally I reached the conclusion that it was not necessary, and furthermore, that it was bad manners. In many instances, when I learned the names of the dentists and found that they were my friends, or were men of commanding position, and tried to induce the patients to go back, they were offended, and did not go back nor did they again ask me to take them in hand.

After long mental debate and many misgivings lest I might be wrong, I adopted the plan of accepting all patients without inquiry as to whose care they had been under. But I did not do this until they had assured me that they had determined to make a change. Then, upon an examination, if I found fine work and the evidence of intelligent and conscientious care, I stated that fact, and gave the patient another chance to go back and be satisfied. If the patient still wished to come to me, I promptly accepted him or her with the feeling of a clear conscience—all the more so because I had no knowledge of the practitioner who had preceded me. If the work was indifferent and I felt that I could do better for the patient, I made no further comment, but accepted the patient at once.

I have followed this course now for many years, and it has seemed to me that this impersonal attitude is a fair solution of this perplexing question. It saves me from unduly favoring my friends, and from the danger of doing injustice to my enemies. It also saves me from the charge of being ill-bred. This may not be accepted by the profession at large, but it suits my temperament better than any plan I have ever tried. It makes the good of the patient the first consideration, and therefore seems to me to be ethical. In discussing with patients the qualifications of other dentists and the character of their work, I know of no ethical reason why extravagant praise may not be indulged in, if it is truly deserved.

If I admire or love a man, I have to tell of it—sometimes even to his face! I cannot help it, and I do not want to help it. A truly fine man is such a fine thing that I think everybody ought to know about him. When in working for a patient another practitioner's name is mentioned whom I dislike or distrust, I try to keep my patient's mouth open and my own shut. I have to do this for fear that my dislike may lead me into doing him an injustice. If I have positive evidence that he is dishonest and therefore unsafe, I have to say so promptly, even though it is painful to do so. It is better for me to suffer the pain of doing what ought to be done, than to let my patient, who should be my friend, suffer the pain of falling into dishonest hands.

The man who seeks patients at his club, his summer hotel, or while traveling at home or abroad, or through the help of his physician or his clergyman (with a long face in church) may not be strictly unethical, but I think he is not as manly as the man who makes a bold fight for his reputation in the legitimate field of scientific endeavor, and waits for his practice to come to him on the higher ground of real worth.

ETHICS IN PROFESSIONAL PARTNERSHIP.

In the whole range of professional life there is no relation where ethical conditions are so necessary as when two or more men are associated in professional work. Generally the senior expects so much, and the junior gives so little that differences arise that are not easily reconciled. From the earliest times our profession has witnessed many such examples. If men come together whose natures are such as would have fitted them for an earlier and more primitive stage of civilization, then ethics, having wings, flies out of the window. On the other hand, if selfishness has been outlived and a fine moral sense exists in each, the relationship becomes mutually helpful and sometimes ethically beautiful.

Under such circumstances it is like floating down-stream under a beautiful sky, with no thought of snags and no worry about running aground! In my mind's eye I can see a dental office

equipped with strong men for each specialty working together for the greatest good of the patients, and at the same time for their own lasting benefit. But alas! where will one find such a bevy of wise angels? The woods may be full of them, but it needs a keen scent to flush them. Perhaps a thousand years from now they will be found in every important office building.

CONCLUSIONS.

I would close with a few personal remarks.

I have been in continuous dental practice since 1865. Forty-four years of as strenuous work, probably, as anyone has ever experienced in dentistry. I am therefore entitled, perhaps, to some convictions, and to the expression of at least one strong desire. Without a doubt this period of nearly half a century has been the most wonderful ever known. Nothing in the whole history of civilization can for a moment compare with the momentous events that have occurred, each new one more stupendous than the last, and all freighted with profound significance to humanity!

Before I came into practice, dentistry had given to the world through Horace Wells the greatest boon it has ever known —anesthesia. Since I began practice, the first efficient Atlantic cable was laid; then came the telephone, the electric light, the trolley car, the automobile, cocain, the X ray, wireless telegraphy, color photography, and now the greatest wonder of all, the flying machine! There has also during that time been established the doctrine of evolution and the practice of antiseptic surgery. Is it not enough to stagger one when contemplating such a march of events! Can any human being have imagination vivid enough to even faintly portray the immense significance to humanity of all these additions to positive knowledge? Back of these material manifestations lie spiritual forces that, as Matthew Arnold said, compel a drift toward righteousness. Ex-president Eliot of Harvard has felt the force of all of this, and has voiced his thought in what some have called the "new religion." I think it would be wiser to call it a saner application of the ethics of the old religion.

Retaining all that is true and vital in the doctrine of the Sermon on the Mount, a new conception of it leads us to accept it as the religion of humanity. Having shed the mysticism and the ecclesiasticism that characterized Christianity in the middle ages, it stands forth in the lime-light of today as an ethical faith that justifies Spencer's prophecy of a reconciliation between science and religion. If I were to venture a further thought, it would be not one of reconciliation, for there has never been a separation, but one of a closer union between religion and ethics, each representing different sides of a great central truth, that great truth finding expression in Ex-president Eliot's "Religion of the Future," the great watchword of which as he says will be "serviceableness!"

To be of service to others is to be ethical in the highest and fullest sense of that beautiful word, and herein lies the hope of humanity. This brings us back to the Sermon on the Mount, which is, after all, the best definition of ethics the world has ever known.

And now I want to state the crowning desire of my life. I want to see my chosen profession continue, as in the past, to devote its energies to the legitimate work of becoming more scientific and therefore more useful to humanity, but I want it also not to forget the binding force as well as the heaven-born beauty of ethics.

THE TREATMENT OF CHILDREN'S TEETH.

By HERBERT L. WHEELER, D.D.S., New York City.

(Read before the Pennsylvania State Dental Society, at its annual meeting, Pittsburg, June 29, 1909.)

BEFORE beginning to explain my method of treating the teeth of children, especially the deciduous teeth, it may be well to try to explain my reason for believing in and advocating that as careful attention be given to the health of the deciduous teeth as to that of the permanent ones. It seems to be evident that in the process of evolution those organs have been preserved that play a useful part in the obtaining of nourishment and in sustaining life. The survival of the fittest is, to my mind, an evidence that those organs which perform a useful function have continued to develop and are retained because they are a necessity to the welfare of the living organism; hence it is my belief that the deciduous teeth are as important in their time and place as the permanent ones, otherwise the former would have become extinct in the hundreds of thousands of years during which the teeth have undergone the process of evolution. Hence, up to the time when nature provides something better to take the place of the deciduous teeth, I believe it necessary to retain them in good, healthy, useful condition. It is therefore my custom, as far as possible, to persuade the families in my care to bring their children to me from three years of age on, and many are the valuable deciduous molars that I have been able to preserve for usefulness to the patient because of having had an opportunity to see the child at that early age.

I am not speaking merely from the standpoint of one whose practice is largely confined to the well-to-do of a large city, for my practice was begun in a small manufacturing town of five thousand, where I had the opportunity to observe the teeth of the children of the machinist and the worker in the wool and cotton mills. Later a number of years of experience in a moderate-sized city enabled me to see the conditions in the mouths of children belonging to all classes from the poor to the wealthy, so that I am familiar with all the various conceivable environments that a dentist may meet with.

In dealing with the deciduous teeth of children we are dealing with organs that play as important a function in the welfare of the individual, both for the present and the future, as any other organ that is necessary for the smooth running of the machinery of life. In dealing with teeth, both deciduous and permanent, it is my custom to consider them entirely from the standpoint of the necessity of preserving a useful organ whose loss can in no way be replaced by any artificial applicance that man is able to produce, and I look upon artificial substitutes not as a boon, but as the least evil that can be inflicted where a greater evil has already occurred—that is, the loss of an organ to reproduce which is not within the power of the greatest dentist that ever lived. With this point of view in mind, I endeavor to preserve the teeth of my little patients in such a way as to obtain the greatest amount of usefulness for the necessary length of time required, with the least pain and discomfort to the child.

The schemes of enthusiastic faddists to produce what they consider a work of art in the mouths of these sensitive and highly nervous patients have no place in my methods, for I believe that anything which will tend to fatigue the patient

very much or inflict pain is to be most carefully avoided. I would even go farther. I believe that the so-called temporary work—replaced often without pain—which preserves the usefulness of the tooth and permits it to fulfil its function is vastly preferable to any so-called permanent work that worries or fatigues the patient.

In caring for the teeth of children, I have found a rather good opportunity for a wide sphere of observation both in my private and in my hospital practice in New York, and I have again and again been surprised at the lasting qualities of some very simple fillings. In instances where there seems to be a lack of growth or development of the jaw, I think it preferable in filling approximal cavities in the deciduous molars to use pink gutta-percha base-plate. This material, heated on a proper gutta-percha heater so that it is not burned or overheated, has remarkable lasting qualities. In fact, in some places in the mouth no other known filling seems to outlast it. I often pack it solidly into both approximal cavities without separating. The expansion of this material is considerable, and I believe it will assist in stimulating an increased growth of the alveolar process. In cases where I do not wish to have the approximal space bridged over, and yet desire to use this filling, I usually place a thin piece of rolled steel, three one-thousandths of an inch, between the teeth and pack the filling against it; when this is removed after the filling is completed, the expansion of the material brings the two fillings so closely together that there is no danger of food wedging between, while a floss may be readily passed through the space. Also in cavities at the cervical margin of the first molar, which, as you know, often occur and which are often extremely sensitive and very prone to recurrence because of the patient's inability to get the brush over the buccal surface of the tooth in such a way as to properly remove the débris, a very little cleaning of the cavity and careful drying will permit the necessary quantity of this filling to be placed so that the present destruction of the tooth is stayed and recurring caries is much less apt to appear later.

In the use of gutta-percha of all kinds it is my custom to trim the edges carefully, by the use of sharp knives of various shapes rather than by the use of hot instruments. The use of hot instruments on gutta-percha fillings in many instances injures the gutta-percha and lessens the durability of the filling, hence I am careful to use nothing more than moderately warm instruments in working this material.

Between the first permanent incisors in simple approximal cavities, which so often occur and which try our patience and skill to prevent them from becoming enlarged to such a degree that they will become unsightly, I generally use white gutta-percha, such as Caulk's Diamond Stopping, which I have always found to be a very good gutta-percha of even quality. For the cavities of the cervical margin I use the same, or another gutta-percha that has been recently compounded by a friend of mine, and which will probably outlast the white gutta-percha.

When I wish a hard filling, and yet, as occurs in many instances, the destruction of the tooth has extended so far that the walls are extremely frail and friable, so that I would not dare to insert either alloy or tin foil, I have had great satisfaction with the use of the mixture of amalgam and oxyphosphate cement, as suggested by Dr. Strang of Bridgeport. In preparing this filling material, I mix the amalgam as usual, using a slow-setting alloy, as the modern quick-setting and highly silvered alloy does not work so well. After having mixed the amalgam as for an ordinary filling, I add about three-fourths by weight as much powder of Harvard cement as alloy filings originally used. This mixture, composed of amalgam and zinc oxid, is then spatulated with the liquid of the oxyphosphate, just as an ordinary cement for a filling would be. This has the quality of being quite as adhesive as cement, and very much more durable. In many instances it will last quite as well as amalgam

alone. In the majority of instances a gradual deterioration of the surface seems to take place. In most cases where I wish a hard filling and yet one that can be carefully placed without undercuts and excavations that weaken the walls of the cavity, I find this to be eminently satisfactory, not only in children's but in adults' teeth. I employ these two ingredients most frequently in deciduous teeth, although in cavities where caries has reached such a depth that an undercut does not have to be prepared because one already exists, and the cavity is not too large, either on the occlusal, mesial, or distal surfaces, I use quick-setting amalgam, such as True Dentalloy.

There is another filling material without which I could hardly get on. It was first suggested by Dr. Luckie of Chester, Pa., although I find that previously to this Professor Flagg had advocated it as a pulp-capping material. It was originally suggested that eugenol be used as the fluid and that zinc oxid be mixed with it to form a thick paste. This is good, but in experimenting in dental clinics I have found that oil of cloves substituted for the eugenol seems to make a hard and more lasting paste, if it is mixed very stiff. I have also put this filling on a freely exposed pulp without removing all of the softened dentin from the cavity, and to my surprise I found it to be doing good service, the filling not being eroded or worn after having been in the mouth for three years. I therefore use this material for two purposes a great deal, and have almost always had good results.

First I consider this filling material valuable in the teeth of children, either deciduous or permanent, where the cavity has extended so deeply that the pulp is practically exposed and yet there has been no serious complaint of toothache nor any evidence of excessive inflammation of the pulp. I mix it into as thick a paste as possible, so that I have to soften it by rolling it between my fingers, and gradually press it into the cavity by the use of a pledget of cotton or spunk. It is much more readily handled in this way than by attempting to use filling instruments of steel or of any other material, as it sticks to the instruments as readily as it does to the walls of the cavity, but does not stick to cotton, if it is mixed sufficiently stiff. If, after being placed in the cavity, it is protected for a few moments from saliva, it will produce an amazingly permanent filling. Unless too much friction and wear is brought to bear upon it, it will readily outlast any kind of phosphate filling in these particular places, but it must not be overlooked that it is not serviceable in all places.

It may also be used with great satisfaction in a deciduous tooth the pulp of which has to be destroyed or is already putrescent. After removing the pulp or cleansing the cavity of the putrid material, as the case may be, and treating it with some form of a formaldehyd-producing material, such as paraform or formalin, I gently pump into the root-canals the following solution:

Thymol,	1 part
Paraform,	1 "
Zinc oxid,	2 parts
Glycerin, q.s. to make stiff paste	

—subsequently filling them with oil of cloves and zinc oxid, which is pressed into the canals as carefully as possible with cotton wound on a broach, sometimes entirely filling the cavity. In some instances the root-canals and cavity may be filled with oil of cloves and zinc oxid; in some cases the amalgam and oxyphosphate combination mentioned is applicable for the cavity; in other cases the oxyphosphate of cement is indicated. In putting in the combination of amalgam and oxyphosphate it seems necessary to allow a little longer period to elapse before moisture is permitted to come in contact with the filling than is necessary in an ordinary oxyphosphate filling. In using a slow-setting amalgam the filling can very often be burnished, after the cement has hardened, so as to impart to the outside of the filling an amalgam surface. This of course is an advantage.

I have experimented but little with copper oxyphosphate, although I believe that in some cases it makes a most de-

sirable filling; neither have I used the combination of plastic tin and copper oxyphosphate, which has been so highly recommended by Dr. George S. Allan, for the reason that I have found the amalgam and oxyphosphate mixture to work quite as easily as copper oxyphosphate and plastic tin, and to be much more permanent. There are of course cases and places where a quick-setting oxyphosphate cement is desirable and necessary, and there may be cases where it is permissible to use gold, but I have never met them; neither have I ever seen a case where it seemed to me to be permissible to use gold caps of any kind on deciduous teeth except for regulating purposes. If a case presents in which the pulp is putrid and degenerated, the tooth being but a mere wreck, black and friable, the least evil that in my opinion can be inflicted is extraction, and this I have done with little compunction; but the cases where I find extraction necessary are extremely rare, except where the roots of the deciduous teeth have not been absorbed owing to a previous loss of the pulp, and erupting permanent teeth require their removal.

Concerning gutta-percha, I am surprised, in studying the records of the work done in our free dental clinics in New York, to find how little it is used by the younger generation of practitioners. This to me seems to be a grievous mistake, for gutta-percha, properly handled, in cavities in either permanent or deciduous teeth, will in many mouths outlast any oxyphosphate or silicate cement, or even gold, and will look better and be more comfortable, thus serving the patient's welfare much better than would metallic fillings. As has been previously stated, I believe that in the case of children it is essential, first, to obtain their confidence, and second to retain it, not by so-called painless dentistry, but by care and by inflicting as little pain as possible, at the same time preserving the teeth in such a way that they may perform their natural functions with perfect ease and comfort to their owner.

If these simple methods are carried out with the children, not only much comfort will result therefrom and much of the fear now obtaining in the minds of the community be dispelled, but many permanent teeth in which the commencement of caries can be traced directly to a decomposing deciduous tooth will be preserved by preventive dentistry rather than by our clumsy and unsatisfactory repair methods; and many young people, who are now discouraged because of the great tendency to caries exhibited in the teeth from the ages of ten to eighteen, will desire to preserve their teeth.

But what is needed with the children, after all, is not so much some utopian method of filling teeth as a means of preventing caries, so that their teeth may not need filling. I sincerely hope that sometime and somehow some intelligent and studious member of our profession will find some means of teaching children to care so well for their teeth that it will not be necessary for them to submit to the discomfort of sitting in a dental chair and undergoing fatiguing operations. Of course, at the present, our chief means of prevention is to teach the children, as far as we may, how to care for the teeth intelligently, how to use a brush, and what kind of brush to use so that all the surfaces of the teeth may not only be kept clean from débris but from plaques of mucin, in which the bacilli develop their deadly work.

Considering the fact that not only the teeth but the mucous membranes that cover the bones of the hard palate and jaws were accustomed to the harsh wear and tear of masticating coarse and unground foods in primitive man, it seems to me reasonable that the energetic use of a reasonably stiff tooth-brush, not only upon the teeth but upon the surfaces of the mucous membrane, is an advantage, because in this way are reproduced somewhat similar conditions to those under which the teeth and mucous membranes of the mouth have been developed; and on the principle that the muscles of the body deteriorate unless given a reasonable amount of exercise, I believe that the tendency of the organs in the mouth to

deteriorate is accelerated by a lack of the wear and friction to which they were originally accustomed.

It seems immaterial what kind of tooth-powder is used, so long as it contains no injurious ingredients, for a reasonably stiff tooth-brush used energetically, but not energetically enough to lacerate the soft tissues, seems of more value in preserving the teeth than all the tooth-powders or tooth-washes that ever have been or ever will be produced.

THE PROBLEM OF ARTICULATION.*

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(Continued from page 19.)

(II.)

CHAPTER III.—DESCRIPTION OF THE ARTICULATOR.

THIS articulator (see Fig. 1, *A*, and Fig. 25), like all others, consists of a movable upper part (Fig. 25, *O*), and a fixed lower part, *u*. To the upper part the straight bow, *O*, is attached and secured by screws, *S*. An extra bayonet-shaped bow (Fig. 1, *O*) can be inserted as in Fig. 25, *o*, or inverted to correspondingly suit the height of the plaster models. To the lower part a straight bow is attached and secured by screws, *S*. An extra bow (Fig. 1, *U*) can be attached having a base that is 1½ ccm. higher. With these four bows six different combinations can be effected to correspond to the height of the plaster models, thus saving much time in their preparation for the articulator. The bows should be oiled and pushed as far into the articulator as they will go, so that should it be necessary for any reason to remove them together with the models from the articulator they can be easily and accurately placed in their former positions.

To the upper bow an adjustable supporting pin, *St*, is attached, which rests on the narrow end of the small plate, *T*, of the lower bow. On this narrow end of the lower bow is attached an inclined plane, *E*, on which the supporting pin moves upward in the side movements. The supporting pin should always rest at the foot of this inclined plane. This inclined plane forms the incisor guide, and serves on the articulator as a substitute for the overbite. Up to the present the artificial incisors, attached with wax to the trial plates, have taken the place of this incisor guide. This was a most uncertain guide, especially in warm weather. For practical reasons, which will not be further discussed, this inclined plane is attached to the lower part of the articulator instead of to the upper part, just as all articulators have a fixed lower and a movable upper part, entirely contrary to the natural relations, but, as is well known, answering the same purpose.

As the supporting pin acts as a guide to the height of the bite, it is placed in

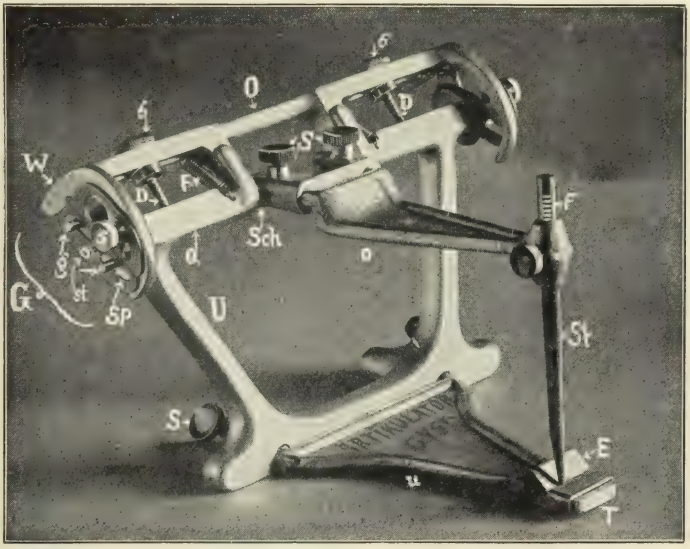
* A translation of Professor Gysi's book, "Beitrag zum Articulationsproblem," published by Hirschwald, Berlin, in 1908, with some practical additions written since its publication.

front of the incisors, because it is only here that a true and secure support can be obtained. If this supporting pin interferes with the setting up of the incisors, it can be removed until the latter are placed in position.

File-marks (Fig. 25, *F*) can be made on the supporting pin, so that there is at all times a guide to show that the height of the bite has not been changed in the setting up of the teeth.

hinge joint, so that in the setting up of the artificial teeth opening and closing movements can be made that are independent of the true joint movement; consequently the two condyle parts of the triangle can be combined exactly and precisely with the incisive part of the triangle in such a way that all unnatural movements are impossible. In this manner the downward movement of the mandible combines with the forward move-

Fig. 25.



The placing of this supporting pin in front of the incisors offers the further advantage that the articulator is quite unobstructed at the back, so that the lingual surfaces of the teeth are clearly visible and can easily be reached with the fingers and wax spatula. This is important, in that it permits of the correct articulation of the lingual surfaces of the teeth.

The most important function of this supporting pin and the inclined plane consists in the prevention of the wrong downward movement of the upper part of the articulator produced in all articulators up to this time when reproducing lateral movements.

The upper bow, *O*, is connected with the upper part of the articulator by a

ment in the direct forward and lateral movements. This combined movement, which has long been recognized, is for the first time accurately reproduced by the articulator. The importance of this fact is fully explained in another chapter.

The upper and lower parts of the articulator are connected through the real joint, *G*, which permits of the lateral movements. Two springs, F, automatically bring the two parts back to their normal positions.

The joint is formed by the fork, *g*, of the lower part of the articulator, the prongs of which pass through the E-shaped part of the upper half and receive the slotted plate, *Sp*. The fork *g* rotates, and with the slotted plate can

be fixed by the screw, 5, at an angle of from 0° to 50°.

The two identical slots in the slotted plate which receive the prongs of the fork *g* correspond in form to the path which the condyles take in their movements during mastication.

To be quite exact, a number of different forms of slotted plates should be kept. From my long experience, however, I have found that the two average forms are quite sufficient, and if the artificial teeth are placed in the exact position necessary to secure the full value of the gradations of these two condyle path forms, the result is most satisfactory. If a special form for every case is thought necessary, as advocated by Campion and Parfitt, it can be easily and quickly sawed out of thin brass plate and placed on the articulator.

The pin, *st*, found on the slotted plate serves to bring the latter into its proper place, and should always be placed in the hole provided for it in the middle of the E-shaped joint.

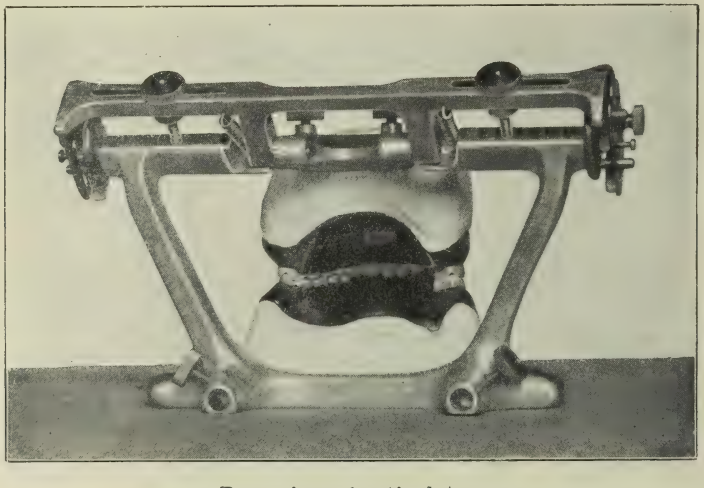
In order to change the slotted plate, the binding screw, 5, is first loosened, then the prongs of the fork *g* are turned to a vertical position, which will allow the plate to slide over the head of the binding screw. With the prongs in the same position another plate can be put on and fixed at the desired angle. This is accomplished by placing the index of the slotted plate at the required degree on the engraved scale, *W*, in the E-shaped joint.

When making full upper and lower dentures without measuring the individual condyle paths, the index of the slotted plate should be placed at the average angle of 30°. It is not absolutely necessary to measure the condyle path for partial dentures. In such work the slotted plate can also be set at the average angle of 30°. In this way, in extreme cases there can only be a difference of 20° above or below this average slant, which is not much when we consider that in using a Bonwill articulator there can be a difference of 45°.

The two small supporting pins, D D, at the back, with the large supporting pin, *St*, form a secure triangle which is not to be found in any other articulator. This, together with the solid cast pieces, prevents any looseness or any springiness, and thus insures the possibility of true and exact work.

The small supporting pins, D D, in the slotted upper part, *O*, can be moved side-

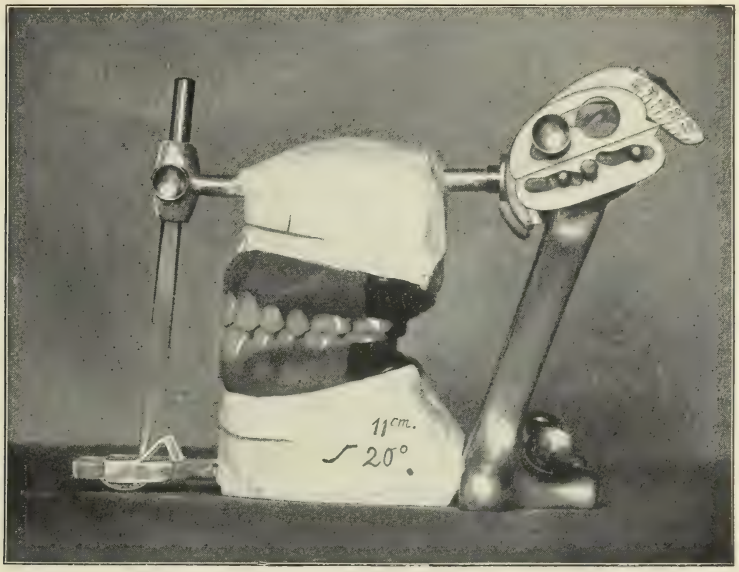
FIG. 26.



Rear view of articulator.

ways. They rest on the transverse piece of the lower part, on which is an engraved scale to indicate the positions of the pins. As the positions of these supporting pins are determined by the incisor path (see explanation to Fig. 32),

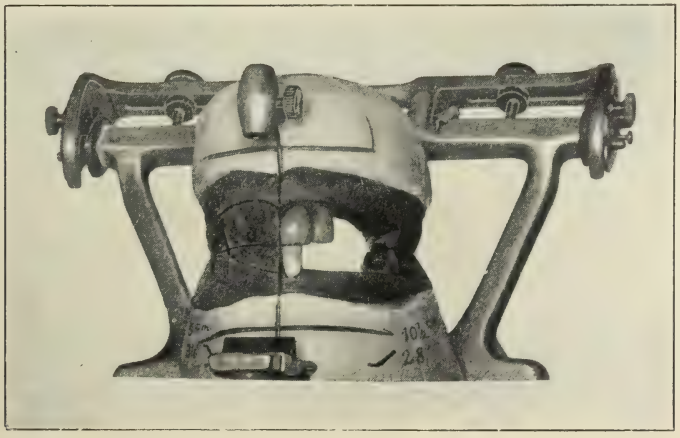
Fig. 27.



Side view of articulator, with incisor guide.

these scales are only of value when two or more full upper and lower dentures are to be made at the same time, when the different positions of these pins can be noted on the plaster models (see Figs. 27 and 32). For unmeasured cases and

Fig. 28.



Front view of articulator.

partial dentures the pins are placed at the average position of 10 cm., forming a Bonwill triangle with the average distance of 10 cm. between the condyles.

These rear supporting pins form the true balancing or rotation points in the lateral movements of the mandible. They can lie from 7 to 13 cm. apart, and even more, in spite of the fact that the condyles in adults on an average seldom lie farther part than 10 cm. These balancing points, as stated before, do not exist anatomically, but are the result of the various muscle contractions that move the mandible, and are its true rotation points during lateral masticatory movements.

When, in trying-in dentures, it is found that the articulation is not correct in lateral movements (which cannot occur, if my incisor register is used), a correction can easily be made by attaching a piece of cardboard or thin metal plate with wax under one of the supporting pins until the proper articulating position is secured, when the teeth can be re-articulated.

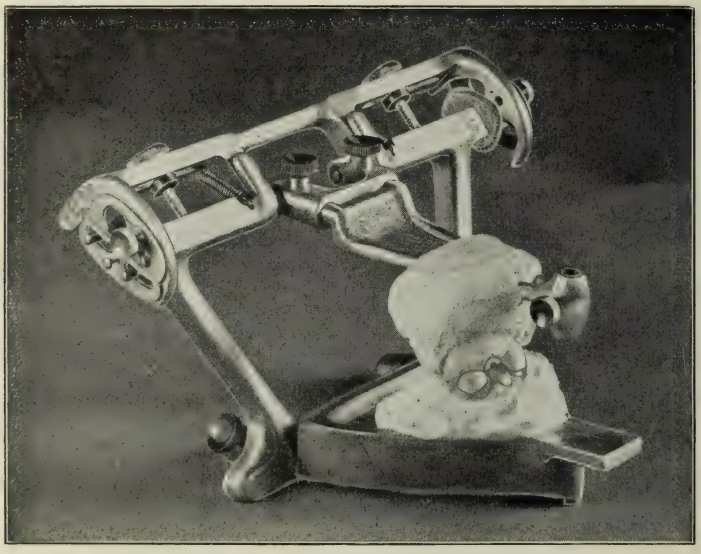
When the articulation is faulty because the mandible has been pushed too far forward in taking the bite, it is corrected in the same manner as in other articulators, by drawing out the upper bow to the distance necessary for correction.

With the rear supporting pins placed at the average position of 10 cm. and the slant of the condyle path fixed at the average angle of 30°, the articulator will be found of great value for all partial dentures, bridges, and even for single crowns; because, when the natural lateral movements are reproduced, the proper height of the cusps can be accurately determined, and porcelain facings can be so placed that the liability to breakage because of improper occlusion or articulation will be reduced to a minimum.

For small models the high-base bow (*U* in Fig. 1) can be used, together with the inverted bayonet-shaped bow, making the space between the bows so small that thick plaster foundations will not be necessary.

The great value of this articulator consists in the fact that complete upper and

Fig. 29.



Articulator with high-base bow (*U* of Fig. 1) and bayonet bow (*O* of Fig. 1) inverted.

lower dentures can be made in exact conformity to the individual relations of the joints, and that when the average positions of both scales are used it is an anatomically perfect, stable, and handy articulator for all partial dentures, crowns, and bridges.

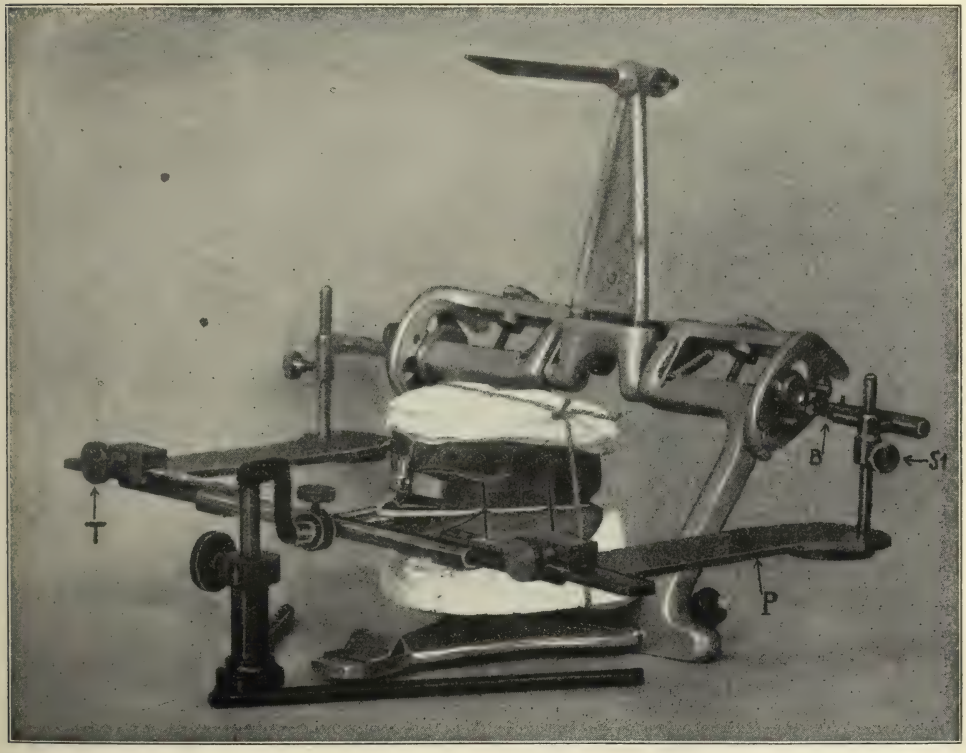
When the articulator is used without the help of the measuring instruments, it is important to place all models so that the occlusal plane is exactly parallel to the table on which the articulator stands, as the degree scales are founded on a corresponding horizontal plane. It is also important to have the front of the models at an equal distance of 10 cm. from the rear supporting pins, thus forming a Bonwill triangle.

Fig. 32 shows how the articulator is best held in setting up the teeth so that all movements of mastication may be executed.

CHAPTER IV.—Fastening the Models to the Articulator.

When the bite has been taken and the relations of the joints have been secured, the wax bite-plates are placed on their respective models. The latter are then placed in correct relation to each other by means of the marks on the wax models without removing the horse-shoe plate. After it has been ascertained that the point of the small register rests exactly in the center of the recording wax surface of the horse-shoe plate, it is pushed up and turned into its resting-place so that it may not separate the models owing to its spring. The models can be slightly fastened together with a little hot wax, and held together temporarily with a rubber band. The large register is then attached to the horse-shoe plate, and with the aid of the holder (Fig. 1, *St*)

Fig. 30.

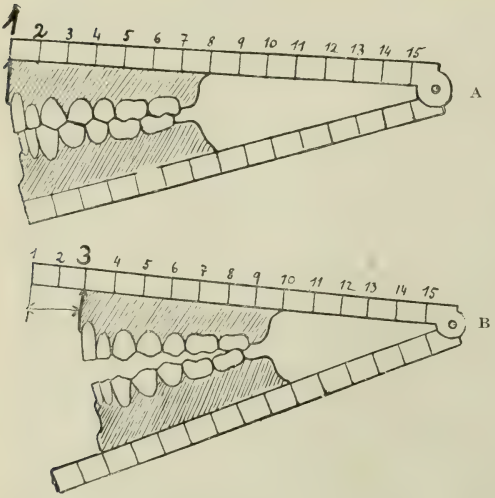


Shows the models ready to be attached to the articulator.

the whole is placed in position as shown in Fig. 30. When the graphite points of the large register are placed exactly at the axis of the fork *g*, the models are in correct relation to the joint.

The plaster models must be cut until they will go into the proper positions. This is important in case it is found necessary, after trying in the teeth, to raise or lower the height of the bite.

Fig. 31.



Shows the consequences of attaching the models at an incorrect distance from the joint.

Fig. 31 shows by means of a cardboard model the result that follows when the models are not attached at their proper distance from the condyles and the height of the bite must be changed. The models in A, in Fig. 31, have been attached too far forward, and the teeth have been articulated accordingly. When these are tried in the mouth, only the molars will come into contact, the incisors failing to meet, while on the contrary, when the models have been attached too far back, only the incisors will come into contact, and the molars will fail to meet. In the latter case it is easier to make a correction—by shortening the incisors—than in the first case, in which the complicated masticatory surfaces of the molars would have to be lowered. If, therefore, the models are placed in the articulator without any attention being paid to their proper positions, it is better to place them too far back than too far forward.

When the models have been attached the large register may be taken away, leaving the horse-shoe plate in its place. The slotted plates presenting the condyle paths are placed in position and set at the desired angle.

Lateral movements are then made and the rear supporting pins are adjusted so that the point of the small register follows the angle K M K, Fig. 14, on the horse-shoe plate. In this manner the true balancing points of the mandible are determined and fixed on the articulator.

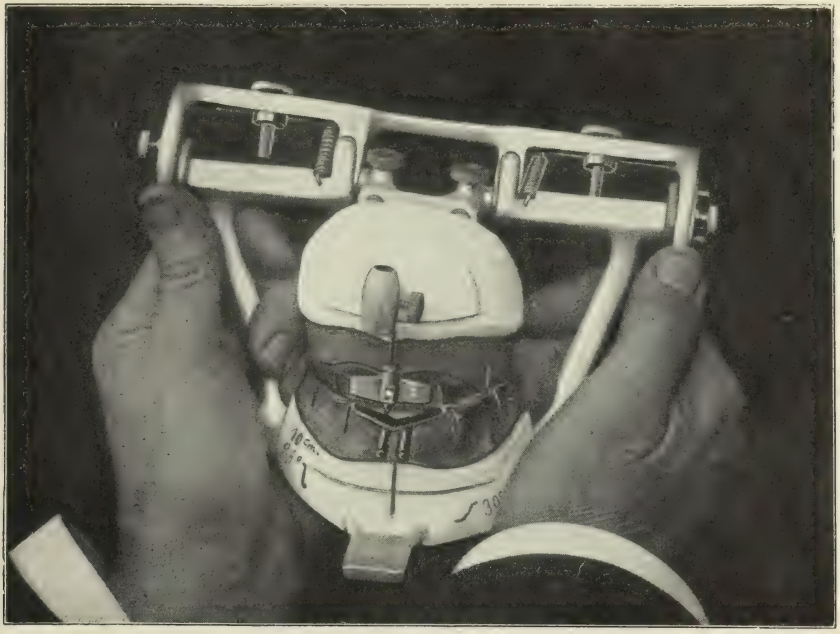
The front supporting pin (Fig. 25, *St*) is then placed in position with the point at the foot of the inclined plane, thus fixing the height of the bite. The horse-shoe plate is taken away, some wax being added to the lower model to fill in the space that had been occupied by this plate. The small register is also taken away, and the setting up of the teeth may now be begun. It is advisable, however, before cutting away the surplus wax from the bite-plates, to mark with a compass on the upper plaster model the position of the lower border of the upper wax bite-plate by a parallel line. The middle line should also be marked on both plaster models. When taking the bite, the lower border of the upper wax bite-plate should be exactly parallel to the eye line and from 1 to 2 mm. below the upper lip, to show the proper length of the incisors. With the compass opened at the same width, the correct length of the incisors and the horizontal plane of the lower border of the upper wax bite-plate can at any time be ascertained. It is best to remove only one side of the upper wax bite-plate when ready to set up the teeth, so that the other side may be used as a guide for the proper placing of the same. (See Fig. 28.)

In handling the articulator, as shown in Fig. 32, the chief masticatory movement (the lateral movement) is reproduced in a direction contrary to the

natural one, because it is only in the return of the mandible from the lateral position to its position of occlusion that effective mastication takes place.

The articulator is, however, best handled in that way, and if the teeth are properly set up to allow this pushing lateral movement, they will allow of shown in Fig. 32, so that the dentures close only from the weight of the upper plaster model. Not until after both dentures have been set up in approximate correctness with the help of the hinge joint may we proceed to arrange the teeth so that they occlude properly in lateral movements. The teeth on one side of the

FIG. 32.



Showing how the proper positions of the rear supporting pins (the balancing points) are determined; also how the articulator is best held in setting up the teeth for articulation in lateral movements.

the chief masticatory movement—the return movement. To produce this movement, it is necessary to hold the articulator as shown in Fig. 33.

If the artificial teeth are set up in a hinge joint articulator lateral movements are impossible, and only plain opening and closing movements can be made, through which the food, especially meat, is simply crushed and the fibers are not comminuted—a most unsatisfactory and incomplete masticatory result.

In setting up the teeth, lateral movements should at first be made only as dentures are slightly warmed, and a lateral movement is made (with the articulator held as shown in Fig. 33), when the teeth are closed in that position. In that way they will be pressed into their proper positions. The opposite lateral movement is then made; then both lateral movements are made a number of times. By going through the same procedure on the other side, and repeatedly placing the teeth in right and left lateral occlusion, they will be pressed into their proper positions even in the most complicated cases.

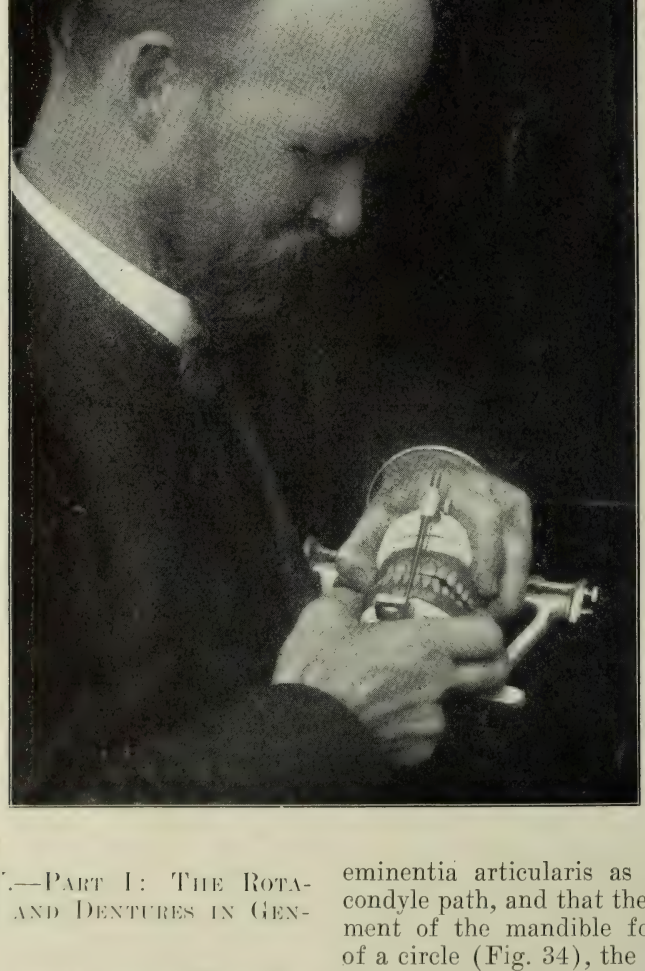
The front supporting pin, of course,

and the inclined plane must be properly fastened, so that the proper bite relations are not changed, and it is presupposed that the masticatory surfaces of the molars have been properly and suitably prepared and arranged—such preparation to be discussed in the next chapter.

condyle path indicates a slightly curved denture. This curvature is the "tooth curve," wrongly called the "compensating curve." (See Fig. 34.)

The anatomist Graf v. Spee was the first to show that this curve had a certain relationship to the slant of the

FIG. 33.



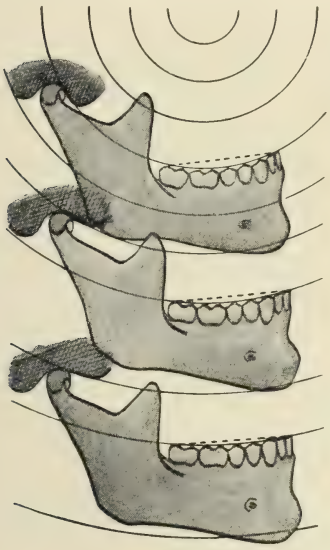
CHAPTER V.—PART I: THE ROTATION POINT AND DENTURES IN GENERAL.

In observing many models of perfect sets of teeth, one is struck by the fundamental difference in the curvature of the dentures. This curve bears a direct relationship to the slant of the condyle path, and it will be found that a strongly inclined condyle path indicates a strongly curved denture, while a slightly inclined

eminentia articularis as well as to the condyle path, and that the forward movement of the mandible followed the arc of a circle (Fig. 34), the center of which could lie between the orbital cavities or above them in the median line of the face. "In the forward bite the condyles and teeth describe the same circular movement." "The steeper the path of the condyle the more pronounced the tooth curve will be, because both have the same radius." (Spee.)

O. A. Weiss also stated (*Dental Review,* 1903) that a decided connection existed between the eminentia articularis and the compensating curve, and in a slighter degree between the overbite and the latter curve. He did not attempt, however, to explain these facts.

Fig. 34.



Christensen also says (*Correspondenzblatt,* January 1902, page 62): "When we think that each movement of a part of a solid body causes the same movement of the whole body, it is clear, as the mandible and the teeth must be considered as a solid body, that the path of the articulation must be identical with that of the condyle path, which runs parallel—that is to say, both paths must have a common axis."

These statements are true only in regard to ruminants, which have an eminentia articularis as well as a tooth curve; they have, however, no incisor overbite as we have, which fact Christensen in his drawing (on page 63 of the above-named paper) did not take into consideration.

Peckert had the same fundamental ideas. In the *Neuheiten und Verbesserungen von S. S. W.,* November 1906, he states: "Naturally the curve formed by the forward movement describes a true circle only when the cusps of the bicuspids and molars have been ground away, and when there is only a slight overbite of the upper front teeth; in other cases a wavering upward and downward movement around the ideal circle ensues, which, however, is of no consequence on the whole."

This is an improvement over the old theories, but I do not agree with his last statement, because there must be added a rotary movement around the condyles, which in the forward and lateral movements accompanies this sliding circular movement: the mandible in that way makes a small opening movement corresponding to the height of the overbite, and thereby the contact of the molars is lost, except with the most pronounced tooth curve, and this contact can only be maintained if long cusps protrude over the tooth curve, standing in a certain relationship to the height of the overbite, as will be shown in the following:

I have found that the true center around which the circular movement of the mandible takes place is in an entirely different position from the one assumed by Spee. (See Fig. 35, *G.*) From this drawing it may be seen how the 60° slant of the incisor overbite overcomes the 33° slant of the condyle path, and how the cusps of the molars, about which we shall speak presently, also harmonize with this center.

Spee's circles, *Z* and *C,* apply only to the forward bite of hoofed animals and ruminants, while my circles, *S* and *C,* apply to the forward bite of rodents, primates, and man.

These theories look very nice on paper. Fig. 35 represents, however, only a special case of a condyle path slanting at 33° and an incisor guiding surface slanting at 60°, and this true rotation point can by different combinations of a condyle path having a slant of from 20° to 50° with an incisor slant of from 50° to 70°, lie at any of the points in the vicinity of *G,* as indicated in the figure, and even still farther away, so that the application of this theory would call for a most unhandy and impracticable articulator, which with different left and right con-

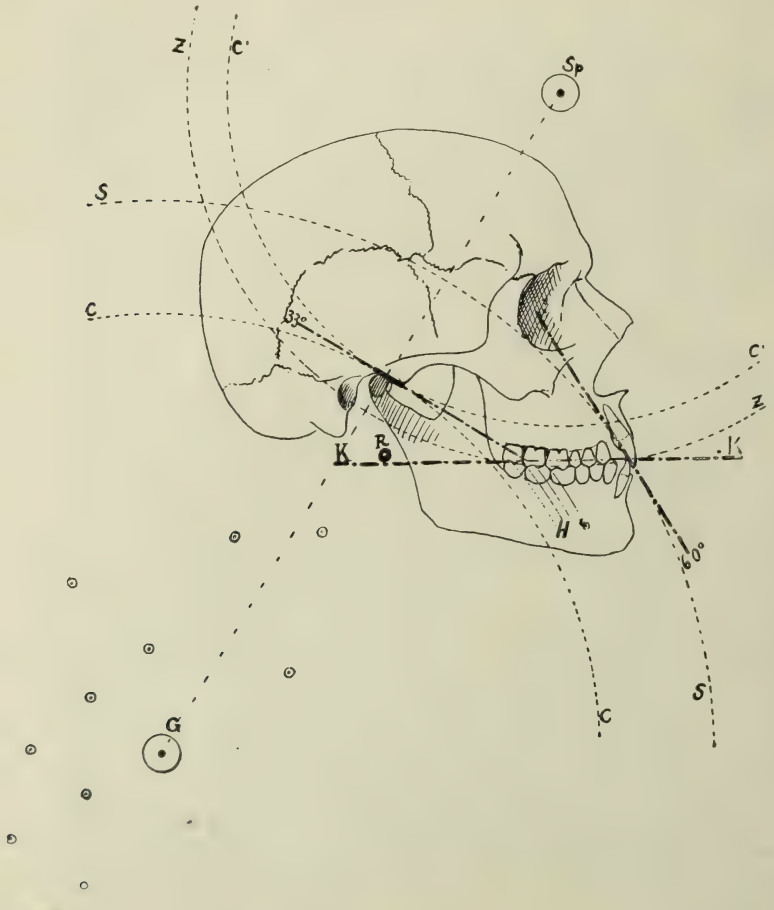
dyle paths would require a very complicated construction.

These rotation points in the vicinity of *G* apply only to the forward movement, as appears from Fig. 35. In the wide opening movement the true rotation point lies in the region of point *R* below

face of the molars, *i.e.* about $1\frac{1}{2}$ to 2 mm.

Frank (Amsterdam) concludes from some wrongly conducted experiments that there is only one rotation point in all the masticatory movements of the mandible, and that this point lies from

Fig. 35.



the condyle on a line with the plane of occlusion, *K*. This has been determined by Tomes and Dolamore (*Trans. Odontological Society of Great Britain*, April 1901), and also by Walker. Kerr's articulator is constructed on this principle (see Spence, *Items of Interest*, June 1907), but this rotation point is of no practical value, because in lateral movements the jaw opens only to the extent of the incisor overbite or the depth of the central fossæ in the masticating sur-

6 to 20 cm. above the teeth on a line with the center of Spee, and at the same distance from both condyles. Were this true, the incisor path register would indicate a true circular line instead of a pointed or Gothic arched curve, and the condyle path register in lateral movements would indicate a backward movement of the condyles that would be as long as the forward movement, while in reality this latter movement is five times as long as the forward. As his rotation

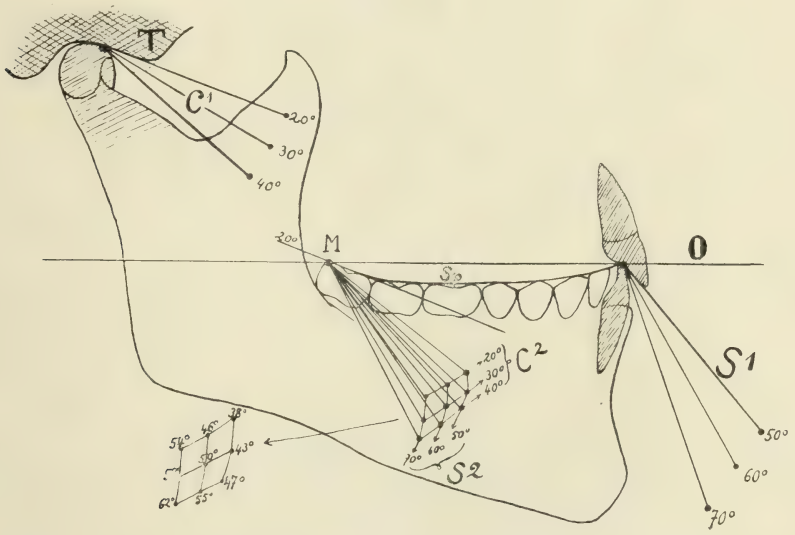
point according to his "exact" measurements is very changeable, he expresses his conclusion in the classical expression that an anatomical articulator is "good for nothing." (*British Dental Journal,* April 1908.)

Exact experiments have shown that when the jaw opens the small distance necessary to correspond to the height of the overbite, the condyles remain in their normal resting positions, consequently the rotation point in this small opening movement lies in the axis of the condyles, and only this rotation point need be considered in the opening movement of an articulator. The search for other rotation points of the mandible has really no practical value, but is more a scientific sport like the search for the north pole of the earth.

I have therefore constructed my articulator in regard to its opening movement independently of these different rotation points, and have utilized only the rotation point which lies in the condyle axis, which alone plays a rôle in the lateral movements and which is the true rotation point in the small opening movement necessary before lateral or masticatory movements are possible.

With movable paper models and numerous figures Peckert has illustrated how pronounced Spee's tooth curve (compensating curve) should be in order to compensate for the incisor overbite. These drawings to some extent are artificial products, because in those cases in which Peckert wishes to show that the compensating curve is too small to overcome the incisor overbite he draws the molars with very flat masticating surfaces and the incisors with a long overbite, and in cases in which he wishes to show how the pronounced compensating curve aids in overcoming the overbite, he draws molars with unusually large cusps and incisors with a short overbite.

Fig. 36.



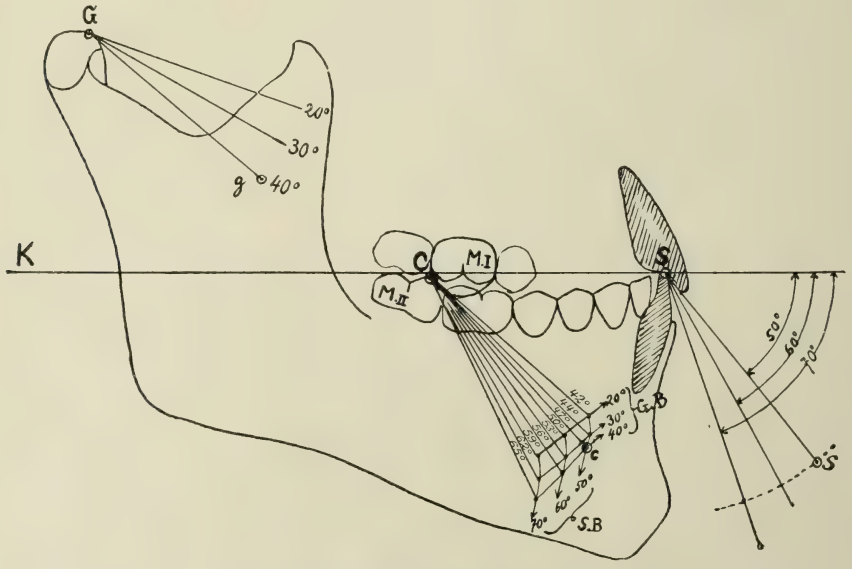
Shows that the "compensating curve" is not sufficient to retain the contact of the molars in the forward movement. *C*, Slant of the condyle path to the plane of occlusion. *O*, Plane of occlusion. S^1, Slant of the incisor path to *O*. *T*, Eminentia articularis. *Sp*, Spee's tooth curve (compensating curve). *M*, Molar point which moves toward C^2 and S^2 when the condyle and incisor points move upon the lines C^1 and S^1.

How it often happens that without any definite knowledge one may unconsciously arrive at the truth may be seen from Peckert's Figs. "4" and "4A." In these drawings it is not the compensating curve that overcomes the overbite of the incisors, but rather the steep slanting surfaces formed by the mesial cusps of the lower molars and the distal cusps of the upper molars.

The most common condyle path angles, of from 20° to 40°. (2) The most common incisor guiding angles, of from 50° to 70°.

If the outline of the mandible in Fig. 36 is cut out, and the condyle and the contact point of the lower incisors and the distal cusp of the last lower molar are marked by points, and a combined movement of the condyle and incisor

FIG. 37.



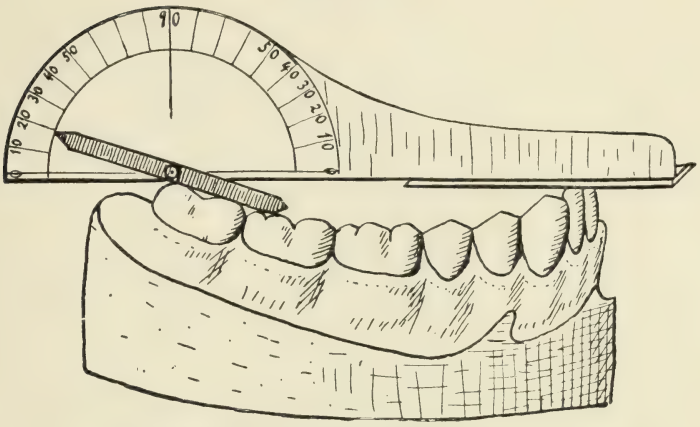
Shows how the compensating surfaces of the molars insure the contact of the molars in the forward bite.

I have reproduced these drawings geometrically, and have verified them by an exact examination of natural dentures, coming to the conclusion that the tooth curve does not deserve the name of compensating curve, but that the term compensating surfaces should be applied to the above-mentioned mesial cusp surfaces of the lower molars and the distal cusp surfaces of the upper molars. The tooth curve should at the most be called a subsidiary curve, because with its aid in extreme cases these compensating surfaces need be less inclined.

Fig. 36 shows how I have determined exactly how pronounced the tooth curve would have to be in order to have a compensating action according to Peckert. The construction is founded on: (1) points is made along the lines of the three most common slants of these latter two points, with the various combinations of the same, it will be seen that the molar point will describe nine different paths, the inclination of which to the occlusal plane registers from 38° to 62°. The tooth curve must therefore register at least 38° to have a compensating action even in the most favorable case. This is nearly twice as much as the most pronounced tooth curve shows in my large collection of models of natural teeth. The tooth curve, therefore, does not play any compensating part in the direct forward bite. This I now proceed to prove.

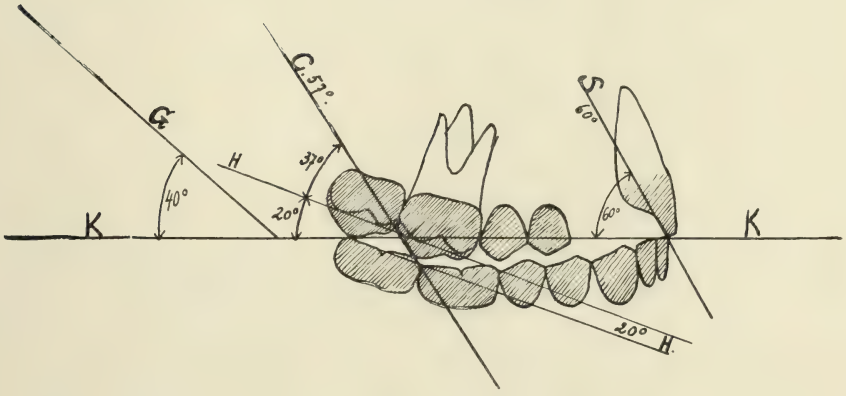
The degree of the tooth curve may be determined in various ways:

FIG. 38.



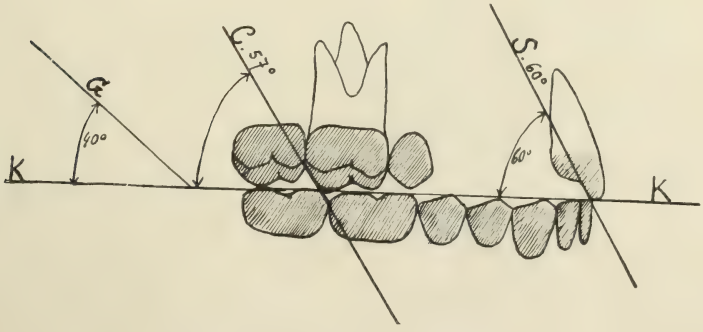
Instrument for measuring the tooth curve.

FIG. 39.



Shows how the tooth curve and compensating surfaces of the molars acting together retain the contact of the molars in the forward bite.

FIG. 40.



Without the tooth curve the compensating surfaces would have to be too much inclined. *K*, Occlusal plane. *C*, Compensating surfaces. *H*, Subsidiary curve. *S*, Incisor path. *G*, Condyle path.

(1) By the amount of its depression below the occlusal plane—expressed in millimeters.

(2) By the length of its radius.

(3) By the angle at which the curve meets the occlusal plane.

In what follows I shall use the last method, considering especially that angle at which the extreme posterior portion of the tooth curve, or the slant of the last lower molar in a sagittal plane, meets the occlusal plane. For it is through this portion of the tooth curve that an approximation of the dentures is accomplished in the forward and lateral movements. On models of natural dentures I usually measure the tooth curve with the instrument shown in Fig. 38.

The most pronounced tooth curve in my collection of models shows a slant of the last molar of 20° to the occlusal plane.

In Fig. 37 I have determined the angle of the paths described by the mesial cusps of the last lower molar by means of the same method as used in Fig. 36. The true compensating surfaces are determined, as stated above, by the mesio-cuspal surfaces of the last lower molars and the disto-cuspal surfaces of the upper first molars. By moving, for example, the condyle point G of the mandible in Fig. 37 upon the condyle path slanting at 40° toward point g, while the incisor point S moves upon the lingual surface of the upper incisor slanting at 50° toward point s, the compensating point C describes a path toward point c at an angle of 47°. Under these conditions the compensating cuspal surfaces of the molars must have a slant of 47° to the occlusal plane if the contact of the molars is to be retained. Fig. 37 also shows that these compensating surfaces may have slants of from 42° to 65°.

FIGS. 41, 42, 43.

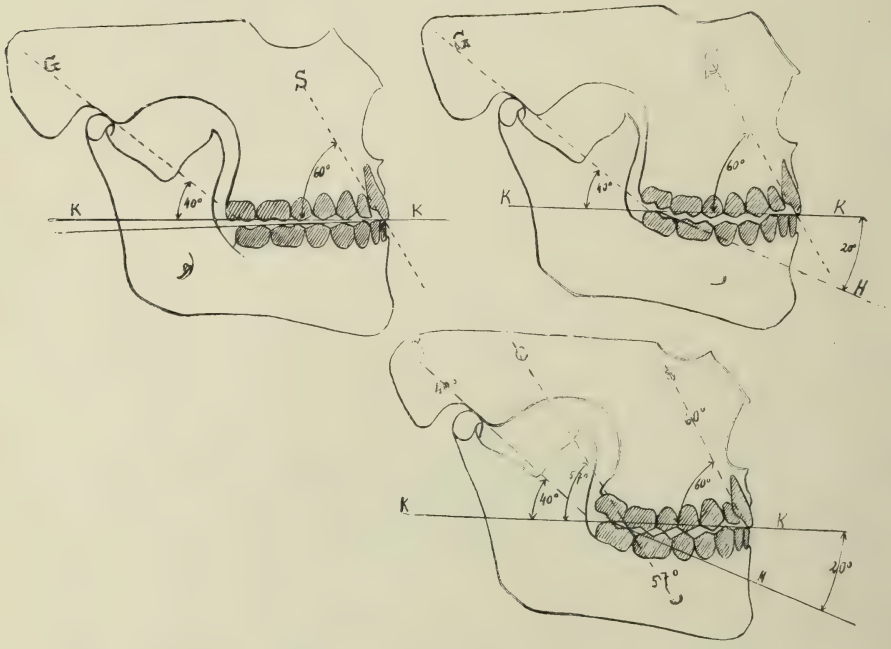


FIG. 41.—Without the tooth curve and with low cusps the contact of the molars is lost in the forward bite.

FIG. 42.—Tooth curve and low cusps are not sufficient to retain contact.

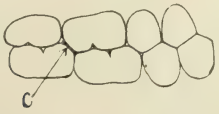
FIG. 43.—Only with tooth curve and long molar cusps is the contact of the molars retained in the forward bite.

Figs. 41, 42, and 43 are examples of three cases of a direct forward bite with the following guiding elements: *G*, Condyle path slant of 40°. *S*, Incisor guide with a slant of 60° to the occlusal plane.

Fig. 41 shows no tooth curve; the tooth cusps are short, consequently in the forward bite the contact of the molars is lost.

In Fig. 42 the tooth curve shows 20°, which is the greatest curve that I have measured. In spite of this pronounced tooth curve there is no contact of the molars in the forward bite, because of the shortness of the molar cusps.

Fig. 45.

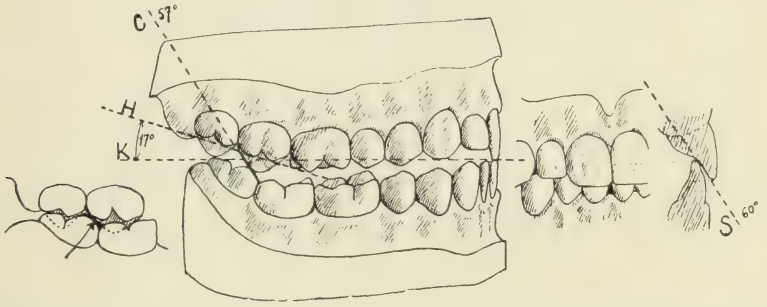


Step arrangement of artificial molars, showing how to secure compensating surface, *C*.

In Fig. 43, in which the tooth curve is the same as in Fig. 42, the proper contact of the molars in the forward bite is present, because the compensating surfaces of the molar cusps are of the proper length.

The tooth curve should rather be termed "subsidiary curve," because by its aid the cusps of the molars need not be so long, and the cuspal surfaces which act as compensating surfaces need not be so much inclined. I have tried to make this clear in Figs. 39 and 40. In Fig. 39 the compensating surfaces *C* are slanted at an angle of 57° to the occlusal plane; on the upper first molar, however, the angle of compensating surface is only 37°, which is exactly less the difference of the slant of the subsidiary curve, which is 20°. In Fig. 40, on the contrary, where there is no tooth curve, the upper first molar must make up the whole difference of the compensating cuspal surface of 57° to preserve contact in the forward bite, necessitating very long and inclined cusps.

Fig. 44.



Shows how the contact of the molars is retained through their compensating cusps when there is a long overbite.

Fig. 44 shows the model on which I discovered the importance of these compensating cuspal surfaces. A steep and long incisor overbite was present; the subsidiary curve registered a slant of 17° to the occlusal plane in the molar region. In the direct forward bite it is clearly seen that the contact of the molars is retained by the help of the pronounced compensating surfaces of the molar cusps, and not by the help of the tooth curve. The third molars being present in this case, the compensating gliding surface is formed by the mesial cusp of the lower third molar and the disto-cuspal surface of the upper second molar.

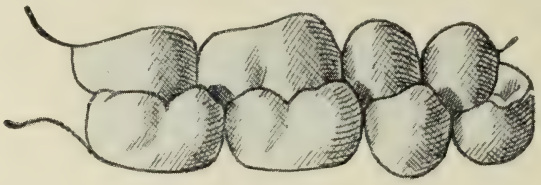
Fig. 47, a lingual side view, shows how all the cuspal surfaces have a compensating action in the forward bite when there is no tooth curve.

Fig. 48 shows how these high compensating cusps pass freely through the in-

terproximal cuspal spaces in lateral movements.

that when this is once properly done the same method will always be followed,

Fig. 46.

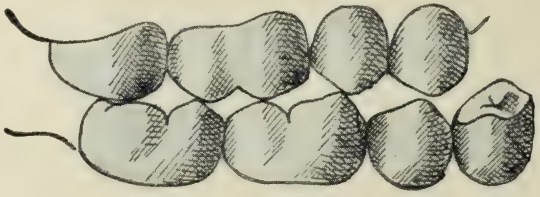


State of rest.

Fig. 46 shows the same teeth (also from the lingual side) in the resting position of occlusion.

as these compensating cuspal surfaces exert their influence not only in the forward bite, but also in lateral movements

Fig. 47.



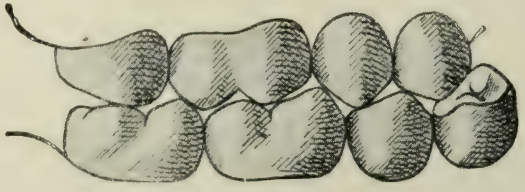
Forward bite.

The step arrangement seen in Fig. 45 is often seen in the natural teeth. (See skull shown by Turner, Fig. 5 of his paper in the Dental Cosmos for March 1909.)

—that is, the true masticatory movements.

In constructing artificial dentures we cannot have a slant of 65° in the compensating surfaces, as the natural con-

Fig. 48.



Side bite.

As no artificial molars with the proper compensating cuspal surfaces are manufactured, we are compelled to shape the molars properly by grinding them. This is easily accomplished if the molars are placed after the manner shown in Fig. 45. The practical results are so good

ditions of firmly rooted teeth are wanting. An artificial upper denture with such steeply slanting cusps would be pushed forward out of place. For the same reason the gliding surface of the incisors should have a slant of only 45° or less.

Part II: The Position of the Teeth.

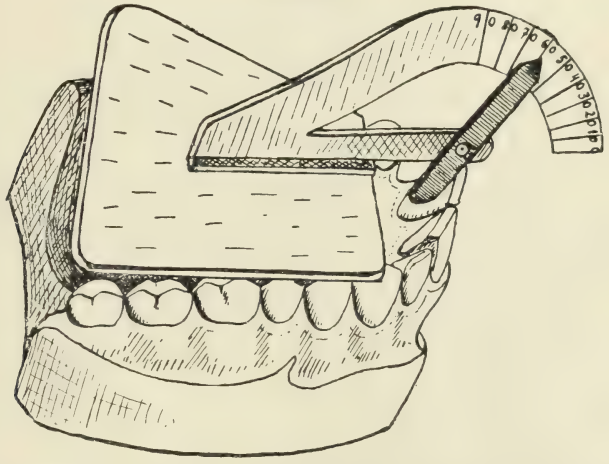
(a) *The Incisors.*

As I have already stated, the length of the incisal overbite is an important factor to be considered in studying the movements of the mandible, as it has an influence on the other teeth. This condition must be carefully considered in the construction of artificial dentures. and a knowledge of the laws governing it will save the practitioner much time, besides insuring a more perfect and proper balancing of the artificial dentures.

Two factors with their variations must be carefully considered: First, the slant of the upper incisors; second, the length of the overbite.

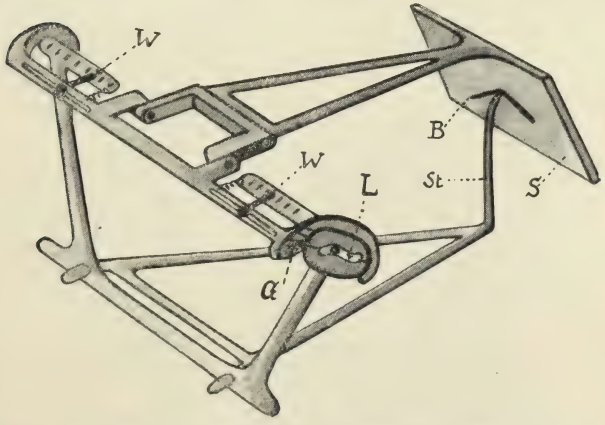
By measuring the slant of the lingual surfaces of the upper teeth concerned in the overbite with the instrument shown in Fig. 49, I found that the slant of the

Fig. 49.



Instrument for measuring the gliding surface of the incisors.

Fig. 50.



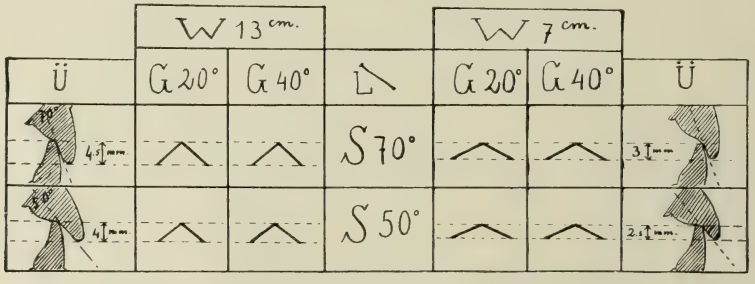
Experimental apparatus designed for determining the connection existing between the overbite and the condyle path and balancing points. (Results are shown in Fig. 57.)

central incisors varied from 50° to 70° to the occlusal plane, and that the lateral incisors and canines registered respectively a slant of 10° and 20° less.

To determine the relationship between the overbite and the condyle path and made by the lower incisors on the surface *S*, representing the lingual surfaces of the upper incisors.

If the elements of the jaw movement are placed at their two extremes—that is, if the balancing points, *W*, are placed

Fig. 51.

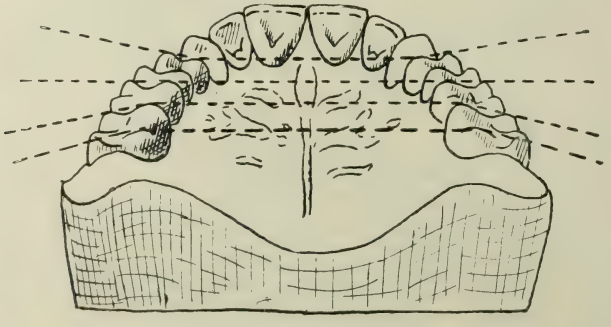


W, Balancing points. *C*, Condyle path slants. *S*, Incisor guide. *Ü*, Overbite. *L*, Length of condyle path. ^, Resultant path of the lower incisors.

balancing points, I conducted numerous experiments with the apparatus shown in Fig. 50, which is a schematic model of my articulator.

To the upper part of this apparatus, in the region of the incisors, an inclined at 7 cm. and 13 cm., equal distance, with the condyle path, *G*, slanting at 20° and 40°, and with the recording surface, *S*, fixed at angles of 50° and 70°, the length of the condyle path, *L*, remaining the same, the results shown in Fig. 51 are

Fig. 52.

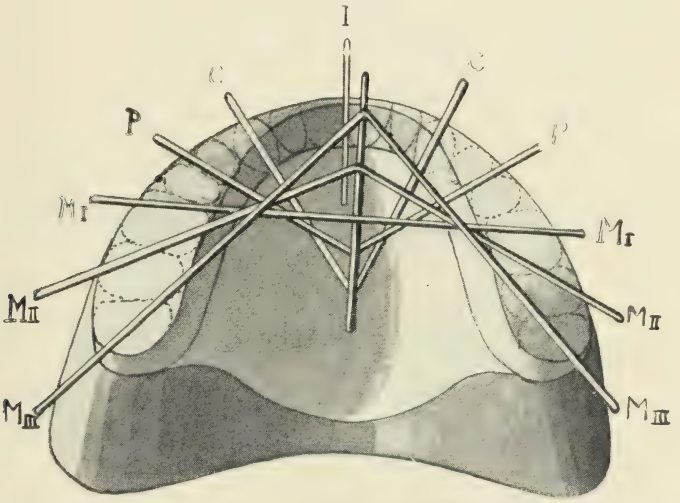


recording surface, *S*, is attached, the slant of which may be changed from 50° to 70° to the horizontal plane. A fixed marking-point, *St*, is attached to the lower part in the center of the incisor region. By executing lateral movements with this experimental apparatus, the fixed marking-point, representing the lower incisors, will record the paths, *B*.

obtained. These results show, first, that the slant of the condyle path has no influence on the length of the overbite; second, that, on the contrary, the position of the balancing points is a factor determining the length of the overbite; third, with the balancing points separated to the extreme distance of 13 cm. the overbite is longest, and that with the bal-

ancing points at 7 cm. the overbite is shortest; fourth, that with a steep overbite of 70°, the overbite is slightly longer than with an inclination of 50° of the lingual surfaces of the incisors. This latter difference is, however, so small that for practical purposes it need not be considered.

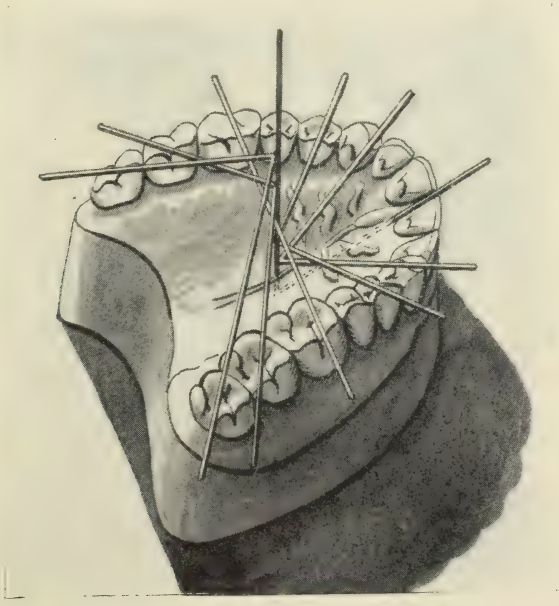
FIG. 53.



I, Incisors. *C*, Canines. *P*, Premolars. *M*I, *M*II, *M*III, Molars.

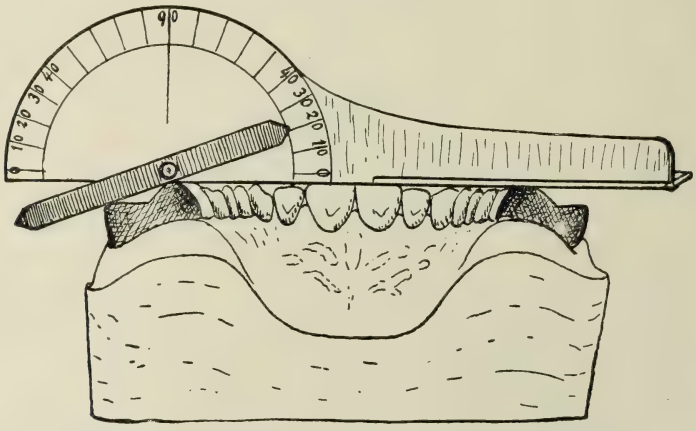
For the practitioner the following law can be derived from the above table: The longer the distance between the balancing points the longer should be the overbite,

FIG. 54.



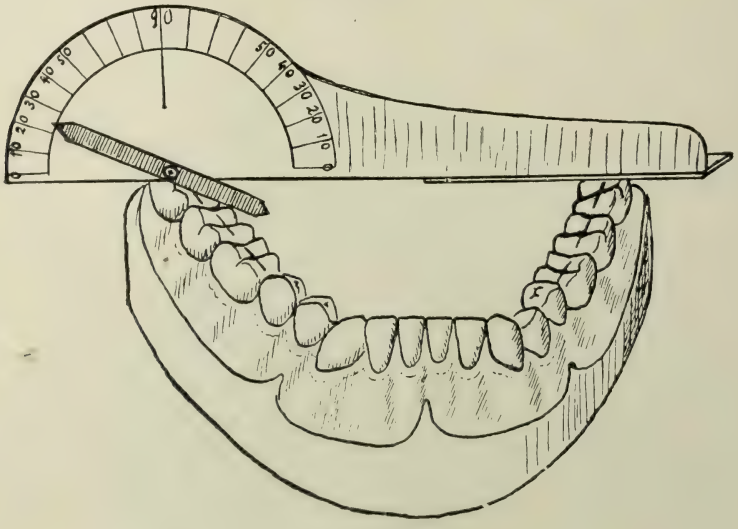
and the shorter the distance between the balancing points the shorter should be the overbite. In making artificial dentures the overbite should, however, not be as long as it is in natural dentures, because the balance of the artificial dentures may thereby be disturbed. The slant of the gliding surface of the incisors, as stated before, should also be less than occurs in natural dentures. In my articulator I therefore arrange for a slant of 45° or less. If the lingual surface of the upper incisors is made steeper the upper denture will be displaced as the lower incisors glide on the steeply inclined surface; besides, the proper placing of the molars for the lateral movement will be rendered more difficult thereby.

FIG. 55.



Instrument for finding the degree of lateral inclination.

FIG. 56.



(B) *The Molars.*

By placing a ruler over the molars on a model of the upper teeth, it can be seen that the buccal cusps are at a higher level

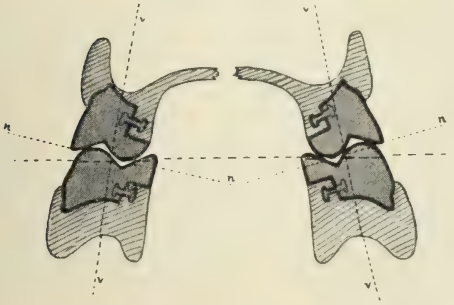
than the lingual cusps. This is very marked in the third, less so in the second molars, and in the first molars the cusps are almost on the same level. In the bicuspids these relations are changed, the lingual cusp being at a higher level than the buccal one. (See Fig. 52.) This is not due to any difference in the relative lengths of the cusps, but rather to the lateral inclination of the teeth.

These relations are schematically shown in Fig. 53, also on a model of the upper teeth in Fig. 54.

The differences in the horizontal levels of the cusps are measured with the instrument shown in Figs. 55 and 56.

The same relation may be seen in Figs. 57 and 60. These illustrations show also

Fig. 57.



Correct position of the molars.

how the upper molars can occlude outside of the lower molars, even though the upper arch be smaller than the lower one.

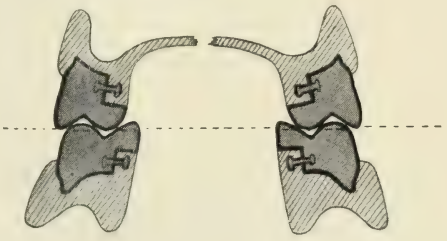
If these characteristic positions of the molars are not copied in setting up the artificial teeth, it is impossible to construct any serviceable artificial dentures. This accounts for the failure of many artificial dentures, and this fact therefore cannot be over-emphasized.

There are certain factors that influence the position of the molars, so that from case to case their positions must be changed. An explanation of these positions will be given in the next chapter.

Besides the necessity of setting up the molars in their proper positions as described above, it is of great importance to see that the teeth are placed exactly over the middle of the alveolar ridges, as advised by Ottolengui (Dental Cosmos, May 1902) and by Hahn, Berlin (*Correspondenzblatt,* October 1907).

In Fig. 58 the position of the molars as advocated by Bonwill is shown. We know now that this position is not correct except in rare cases where there is a horizontal condyle path.

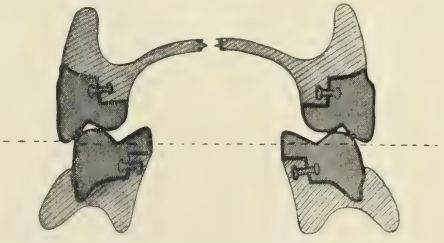
Fig. 58.



Incorrect position of the molars as advocated by Bonwill.

Fig. 59 shows another incorrect position of the molars that unfortunately is often seen in artificial dentures. In this position the buccal cusps of the upper molars are on a lower level than the lingual cusps, for which reason the lower molars on the lingual side do not occlude

Fig. 59.



Another incorrect position of the molars.

and the space for the tongue is restricted. With the molars in this position the upper plate is loosened by the slightest lateral movement. In Figs. 57, 58, and 59 the relative distance between the alveolar ridges is the same, so that the differences in the size of the resulting plates can easily be calculated by comparing these three illustrations.

(To be continued.)

INVESTIGATIONS ON PLAQUE FORMATION AND DENTAL CARIES IN RELATION TO SALIVA:

BEING THE

Report of the Committee on Scientific Research, Dental Society of the State of New York (May 1909).

By L. M. WAUGH, D.D.S., Buffalo, N. Y.,
CHAIRMAN OF THE COMMITTEE.

YOUR committee has in the past year continued the study of the saliva as outlined in the report of a year ago. This embraced a laboratory investigation for the purpose of—

First: Culturing the bacteria of dental caries so that microbic plaque formation will occur.

Second: Ascertaining whether or not potassium sulfocyanid will exert an inhibitive influence on plaque formation.

Third: Determining the character of the plaque material.

In the first two fields of investigation progress was made. Because of concentration on the first and second, the last one was not followed up. This should be done later.

Report of Laboratory Work.

Culture Medium.

In making the medium for this experiment, the first difficulty was encountered in trying to obtain a young lamb sufficiently fresh for the purpose. The butchers object to cutting up the animal directly after killing, as it spoils the conventional appearance of the so-called "spring lamb," and renders the rest of the carcass unsalable. However, by the kind aid of Dr. Wende of the U. S. Bureau of Animal Inspection and his colleagues, the purchase of a very young lamb—about a week or ten days old—was made possible. This animal was about the size of a full-grown cat, and after it had been skinned and dressed there was difficulty in obtaining 500 grams of meat from it. There was practically no fat. The flesh was bruised with an ordinary steak-beater and kneaded with the hands in 1000 ccm. of spring water (Lehn Rock) containing considerable calcium carbonate in solution.

The milky broth was strained from the flask, and enough spring water poured over the contents of the strainer to make 1000 ccm. of the finished liquid. This was put in test tubes previously plugged with cotton and sterilized in dry air at 160° C. for one hour.

The medium after being tubed was pasteurized at a temperature of from 72° to 76° C. for periods of five hours each, one-third of the tubes being pasteurized on two successive days, and the remaining two-thirds on three successive days.

There were also filled with the medium four sterilized, plugged 50 ccm. flasks, which were pasteurized on three successive days for periods of five hours each. These flasks were used for the original culture and for the purpose mentioned later on.

A stock of nutrient agar-agar was also prepared, which was tubed, sterilized, and slanted in the usual manner, these agar tubes to be used as controls.

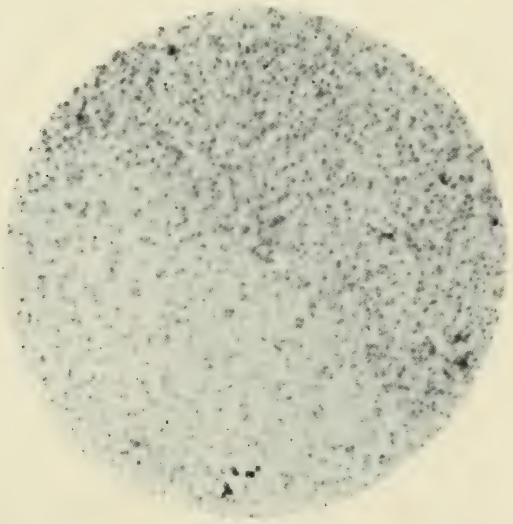
Inoculation, Incubation, and Restraining Agents.

On Monday, April 26th, two of the flasks of the medium were inoculated

from the mouth of a patient in the college infirmary in the following manner: Two sterilized wide-mouth sputum bottles were handed to the patient, who collected in the bottles what saliva he was able to supply (about 5 ccm. in each). One bottle was reserved to test for potassium sulfocyanid, which was found to be $1\frac{1}{2}$, coinciding with the color chart of the Research Committee. In the one bottle of saliva there was placed a small quantity of decaying substance from a carious molar which had been scraped out with a sterilized dental excavator; the material was well mixed with the saliva and part of it was poured into each of the four 50 ccm. flasks. These were then plugged and placed in the incubator for twenty-four hours; then an agar tube was inoculated from each flask, and the tubes, together with the flasks, were placed in the incubator for another twenty-four hours. The tubes were then examined for growth, and were found positive, the growth found consisting of various organisms of both micrococcus and bacillus forms, a short spore-bearing bacillus with rounded ends being prominent. Most of the organisms were Gram positive as regards staining. The whole of the tubes, 116 in number—both those pasteurized on two and on three days—were inoculated in the following manner:

The usual "3" loop of a platinum wire was considered inadequate. Therefore pipettes were made from glass tube heated with a gas blowpipe and drawn out to long slender ends. These were then placed in large test tubes and sterilized in dry air at 160° C. The rubber nipples were sterilized by boiling in water. With these pipettes the test tubes were all inoculated with medium from the inoculated flasks by introducing three drops into each tube. All of these were then, on April 30th, placed in the incubator for forty-eight hours. The tubes were then numbered and agar tubes were inoculated from each tube to ascertain whether a growth of organisms was present in each tube. These agar cultures all developed an abundant white growth within twenty-four hours.

FIG. 1.



(From tube No. 10.) Agar-agar culture, showing organisms in zoöglea condition. The lighter zone surrounding the organism is the plaque-forming material. (× 1600.)

The inoculated tubes were then treated as follows:

A tube of medium not inoculated was tested as to the quantity of potassium sulfocyanid that must be added to give it the same tint as average saliva when tested with ferric chlorid solution. It was found that three drops of a two per cent. solution of potassium sulfocyanate from a certain glass pipette gave this tint, which is between $3\frac{1}{2}$ and 4 on the color chart. Then certain of the tubes were prepared by dropping into them the above amount of potassium sulfocyanid, while others were left without it.

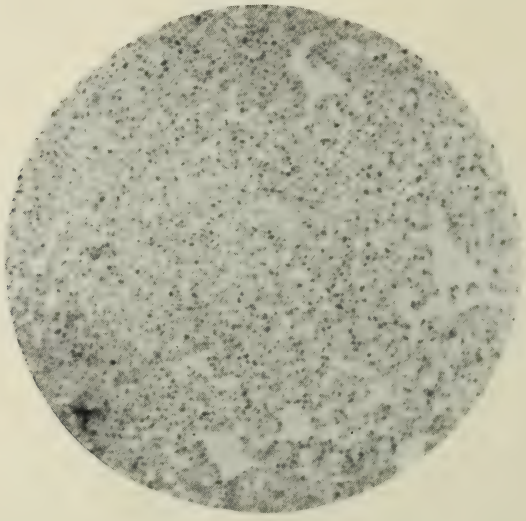
Some of the tubes were then treated with varying amounts of carbolic acid (a five per cent. solution being used for this purpose), and some with oil of cassia. The cassia was prepared by adding an excess of the oil to some small flasks of media and agitating occasionally for forty-eight hours, after which the emulsion was drawn off from the sediment with a sterilized and graduated pipette and placed in the test tubes. The tubes that had been pasteurized only twice were inoculated on May 7th; those pasteurized three times, on May 8th. After the tubes had been thus treated they were well agitated, and this was repeated in twenty-four hours. They were then allowed to stand for about fourteen days, being examined from time to time for the formation of plaques.

The tubes Nos. 112 to 116 were the first in which plaques were observed, and the tube marked No. 1 was the last in which they were found. Tubes Nos. 61 and 62, also Nos. 93 and 96, had only one or two, but tubes Nos. 110 to 116 inclusive had many plaques. One tube, No. 30, was accidentally broken before any plaque had formed.

In the microscopic study of these plaques it was found almost impossible to get one off the side of the tube by using the ordinary platinum wire, or the loop, so tenacious was the plaque material. With a stronger instrument removal was possible, and the material was transferred to a cover glass, mounted, and stained. In doing so it was of course somewhat crushed.

An attempt was made to stain and examine a plaque attached to the test tube

FIG. 2.



(From tube No. 53.) Agar-agar culture, showing thinner field. The individual organisms and zones of plaque material may be clearly seen. ($\times$ 1600.)

by breaking the tube, but unfortunately the break did not occur in the proper direction, and it was next to impossible to obtain a focus because of the curve of the tube.

Summary of Laboratory Work.

Total number of tubes inoculated, 116. Total number carried through, 115, one tube being accidentally broken.

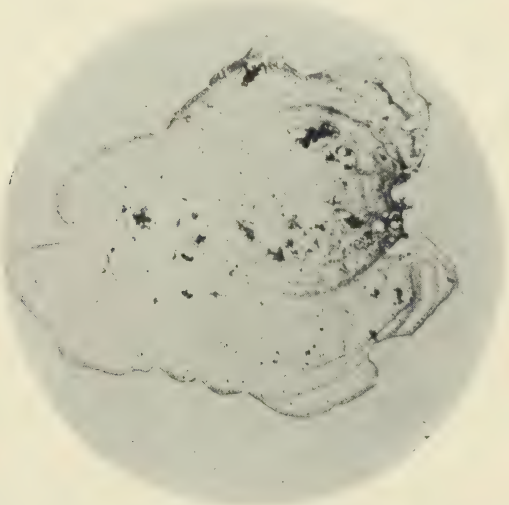
Ten tubes had only KCnS added; in none of these plaque formation occurred.

General Summary.

To sum up the effect of KCnS in retarding plaque formation, as shown by the foregoing experimental work:

Between five and six tubes without KCnS formed plaques, in proportion to one tube with KCnS; or, in other words,

Fig. 3.



(From tube No. 85.) Showing an entire plaque under low power. At the margins the organisms may be seen. (Magnified about 40 diameters.)

Ten tubes were *not medicated* in any way. One developed a plaque; the causative factor was not determined. This gives 10 per cent.

Fifty-one tubes were treated with *carbolic acid solution.* In twenty-six of these, KCnS was introduced in addition, none of these developing plaques. Of the twenty-five tubes cultured without KCnS, ten developed plaques, or 40 per cent.

Forty-four tubes were treated with *cassia emulsion.* In twenty-four of these KCnS was introduced in addition. Three tubes developed plaques, or 12½ per cent. Of the twenty tubes cultured without KCnS, seven developed plaques, or 35 per cent.

plaque formation was five to six times more prevalent when grown without KCnS. Furthermore, the plaques were smaller and appeared less vigorous in the tubes that contained KCnS.

There is also the additional consideration of the effect of a continuous supply of KCnS as furnished in the saliva. In the test tube the effect of the KCnS is probably gradually lessened as growth progresses.

Your committee feels that the findings here given should be verified by a repetition of the work by others, but that the administration of KCnS as outlined by the committee of 1906 is warrantable, and should be carried on by more men,

in order that its effect as observed clinically may be reported.

Your committee respectfully suggests to its successor the further study of the microbic plaque after the technique here outlined, with the following improvements:

The culture medium. Take 500 grams of the lean meat of a recently killed young lamb, bruise it well (do not chop it). Knead this with well-scrubbed and cleansed hands, using no disinfectant (sterilized rubber gloves may be used) in one liter of spring water containing calcium carbonate in solution, until a milky fluid with a slight tinge of pink is obtained. Strain this through cheesecloth (well boiled in water to remove the dressing and to sterilize it), pouring enough spring water over the strainer to bring the quantity up to 1 liter. Put the fluid into two 500 ccm. flasks or four 250 ccm. flasks, and heat these in a steam sterilizer at 75° C. for about two hours to coagulate the albumin. After cooling, shake the flasks well to break up the coagula, and strain the fluid through absorbent cotton. It should then appear clear or slightly opalescent (repeat the cotton straining, if necessary, to obtain this appearance). Put the fluid into sterilized plugged tubes and pasteurize for periods of five hours at from 70° to 75° C. on two or three successive days. This will yield an eminently successful culture medium.

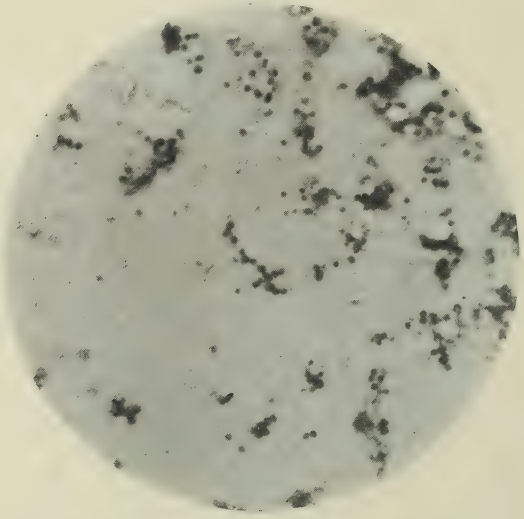
Test tubes. In order that the plaques may be studied *in situ*, long strips of thin clear glass of suitable width are placed into the tubes, when plaque formation on their surfaces should result. These glass strips may be removed and studied under the microscope, with or without stain. Drying, fixing, and covering will be done in the usual manner.

This might also prove an aid in determining the character of the plaque material.

Natural extracted teeth should be suspended in the culture tubes to determine whether plaques will form on their surfaces; and if so, whether on the addition of carbohydrate foodstuffs decalcification of tooth structure will result.

There are other ingredients of the saliva than potassium sulfocyanid that are

FIG. 4.

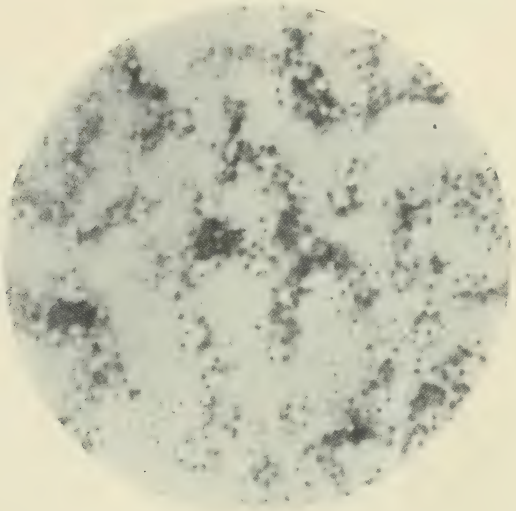


Showing portion from Fig. 3, under high power. Note the marked similarity in plaque-forming material to organisms in Figs. 1 and 2. (× 1600.)

active under certain conditions as predisposing causes. Mucin is one that should early be investigated. Glutin seems to exert an influence, and should also be studied.

In conclusion, your committee wish to express their gratitude to Dr. Frank W. Low for helpful suggestions and encouragement in the progress of the work; to Mr. Damon R. Averill, for his unusual interest taken in making the photomicrographs; to the Dental Department of the University of Buffalo for the use of the bacteriologic laboratory and necessary apparatus, and especially to Dr. George Fenn Roberts for the intelligence and zeal with which he aided the committee in the laboratory technique. Without the help of his experience and close interest the results would have been less accurate.

FIG. 5.



Another field from Fig. 3, under high power, showing same as in Fig. 4. (× 1600.)

(All were stained in Loeffler's methylene blue.)

REPORT OF A CASE OF ALVEOLAR ABSCESS WITH EXTENSIVE NECROSIS.

By J. M. WALKER, M.D., Dubuque, Iowa.

(Read before the fall meeting of the Dubuque District Dental Society, held at West Union, Iowa, September 8–9, 1909.)

I WILL not attempt to describe this case in detail, as I am sure every member of the society is thoroughly conversant with the etiology, pathology, etc., of alveolar abscess. My excuse for presenting this to you is that I believe there are some features about it of sufficient importance to both dental and medical professions to warrant its presentation to the societies of both professions. This case at the beginning was probably identical with many others which are treated every day and result in almost spontaneous cure, but owing to the depraved condition of the patient's health and possibly to the neglect on the part of the attendants, extensive bone necrosis resulted.

Personal history. P. K., male, age twenty-seven years. Eight weeks previous to coming under observation he had been confined to the hospital and treated for pnuemonia. During the fourth week of his illness, an abscess on the left cheek was opened externally and drained by the attending physician.

Personal observation. The patient presented himself to me on January 21, 1909, four weeks after the abscess was opened. He was very much emaciated, weighing only 90 pounds, his usual weight being 140 pounds. The lower left jaw showed considerable indurated swelling, with a discharging fistula slightly forward to the angle of the jaw. Examination of the mouth disclosed multiple fistulæ and very spongy gums, extending almost the entire length of the lower left jaw on the labial side. The gums on the lingual side were slightly spongy, but no fistulæ were present. The lower left first molar showed a very small cavity no larger than a pin-point. This tooth had been treated once with arsenic seven years before by a dentist, the patient refusing to return for further treatment. The other teeth were perfectly sound, the set being complete. There was very limited movement of the jaw, about three-eighths of an inch between the upper and lower incisors. The temperature was 103°, the pulse 110, and the patient coughed considerably. A large opening was made by forcing a pair of hemostatic forceps into the gums and withdrawing them while opened. The cavity was washed with antiseptics, and treatment administered for improving the general condition. In twenty-four hours the temperature subsided to 101°, and the pulse to 90, and remained so for one week, during which time the patient was seen daily. There was only a small amount of pus discharging from the inside, as the external fistula had closed during this time. On January 28, 1909, one week after opening the gums, the temperature suddenly rose to 105.2° and the pulse to 160. The patient was very nervous, his cheek swollen and more hyperemic than before. I immediately ordered him to Mercy Hospital, and extracted the first and second lower molars on the left side, also made a puncture at the site of the old fistula, and inserted iodoform gauze drainage through and through. Three days later I extracted the third molar, as the gums had receded, and the tooth was loose in its socket, although I had hoped to save this tooth for the purpose of fastening a bridge to it later on. The patient left the hospital two weeks later, slightly improved physically, but not much change had taken place in the oral tissues.

Bacteriology. At the time of the extraction of the third molar, a smear was made, which very much to my surprise showed staphylococcus pyogenes aureus to be the infecting germ rather than the diplococcus of pneumonia, which is a very frequent cause of alveolar abscess, and which I was certain was the exciting cause in this particular case, as the patient was suffering from pneumonia at

the time of the infection. Staphylococcus vaccine was used for a period of six weeks, followed by a decided improvement in the patient's physical condition, he having gained 25 pounds during that time. The interior portions of the cheek showed but very little change, a fistula discharging pus posteriorly above the angle of the jaw still remaining.

Three weeks after the removal of the teeth the alveolar process, which was protruding swollen and indurated almost down to the clavicle. He came prepared for a second operation, which I had advised him would be necessary as soon as his physical condition would permit. At this time he weighed 130 pounds. I consider that most of his improvement physically was due to the use of the vaccine. On April 2, 1909, I operated by making an incision along the border of the lower jaw, extending it upward at the angle,

FIG. 1.



Showing normal position of chin and scar from operation.

FIG. 2.



Showing both sides of face to be normal, with no lateral deformity.

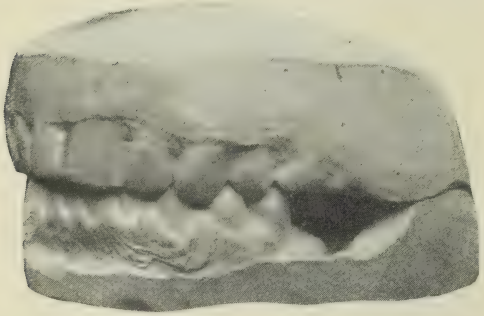
through the gums, was noticed to be slightly loosened. I consulted Dr. Taylor, a dentist, who with my assistance succeeded in removing two large pieces of alveolar process. There was a considerable discharge of cheesy pus and hemorrhage during the removal of these pieces. In two weeks the swelling of the tissues had considerably subsided. All of the soft parts presented a healthier appearance, but the fistula posteriorly continued to discharge pus. Until April 1, 1909, for about two months I saw the patient at my office two or three times a week.

Operation. On April 1, 1909, upon presenting himself the patient complained of considerable pain in the neck, which was greatly as the pus from the internal fistula appeared to be coming from the ramus. Upon getting down to the bone, the body was seen to be necrosed through at a point opposite the former position of the first molar. A considerable portion of the mandible was cut away in an effort to find healthy bone, with the intention of wiring the ends of the bone together, but as the body was necrosed to such a great extent, I concluded to remove the bone only up to the articulation, which, however, shows clearly the amount of necrosis which had taken place. The periosteum was left in place, and the cavity cleansed and drained with iodoform gauze. The patient left the hospital after two days. Owing to excessive hemorrhage, Stenson's

duct was not recognized at the time of enlarging the incision and was cut through. Upon closing the wound only the proximal portion could be picked up. The tissues were coaptated carefully, it being hoped that the secretions from the gland would drain into the mouth. As there was already an opening through the cheek, a subsequent salivary fistula forming externally was feared. Nature, however, took good care of it, and no further trouble was experienced.

Subsequent history. One week after leaving the hospital the patient to my amazement reported at my office at 9 A.M. with the lower jaw drawn to the left side (which had been operated upon) so far that the teeth articulated only at one point, leaving a space of half an inch laterally between the upper and lower teeth of the right side. As it was impossible to force the jaw into normal position, I concluded that the deformity was due to his head and face having been bandaged too tightly during the relaxation of sleep, and I accordingly loosened the bandages. In three hours the jaw had *gradually* returned to its normal position. The next morning he presented himself in the same condition as the day before. Nothing was done at this time, as I wished to see if the jaw would return without removing the bandages. At 2 P.M. the mandible had gradually returned to normal articulation. This condition was repeated for several mornings, so that I began to think of something to prevent its occurrence during sleeping hours, as I feared a permanent deformity. I again sought Dr. Taylor, who made a mold for the chin and used a head-gear, fastening the two with a rubber band, which contrivance was to be worn at night. Tight bandaging over night with closed jaws was tried; also a plate with teeth was made to fill the cavity in the jaw. Then clamps were adjusted on the upper and lower molars of the right side with a rubber band, to remain on permanently. All of these contrivances, however, failed to keep the jaw in its proper position during sleeping hours, and as a last resort I made a plaster-of-Paris mask to fit the face and head with the jaw tightly closed, which was intended to be worn at night, but before the patient had an opportunity to wear this last appliance the jaw ceased its nightly excursions and did not give any further trouble in that regard. This condition was caused, I believe, by spasmodic contractions of the muscles of mastication, due probably to irritation resulting from the operation or latent infection.

FIG. 3.



Showing perfect articulation, also cavity due to removal of teeth.

At the present time (now several months later) there is practically no deformity except a scar along the border of the jaw. A firm and strong jaw has developed from the periosteum. The teeth articulate perfectly, and the patient has as much control of the movements of his jaw as ever. It might also be added, that from the very beginning he was able to masticate solid food. His general health is good, his weight at present being 145 pounds.

The accompanying photographs show the patient as he looks at the present time. There is no deformity and very little scar. Since the photos were taken, the patient's facial appearance has considerably improved.

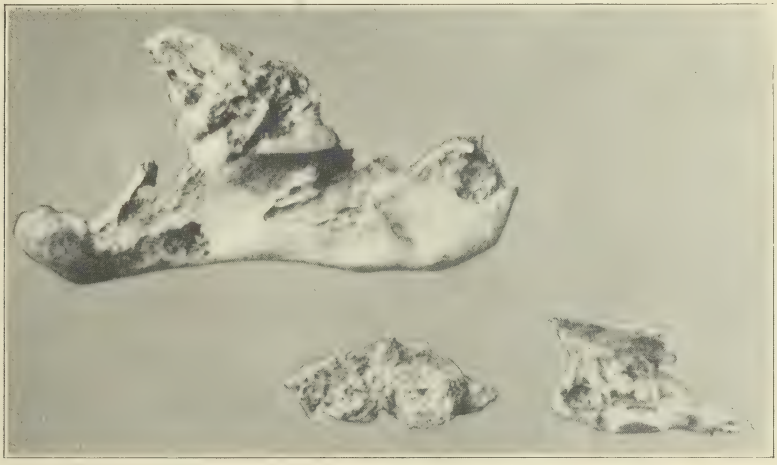
Discussion.

H. G. LANGWORTHY, M.D., Dubuque. The case of acute osteomyelitis of the mandible, with resection of a portion of the entire jaw and substitution of an artificial apparatus for holding the missing teeth and continuing the jaw line, which Dr. Walker reports is not only most interesting but decidedly rare. There are probably not many present here tonight who have seen many of these severe cases. Both Dr. Walker and Dr. Taylor are to be congratulated upon their results, which were all that could be desired. Although I was fortunate enough to see the case in consultation, I have little more to add to what the essayist has already stated. The most striking features connected with the

course of the disease as they appeared to me were: (1) An undoubted direct infection of a large area of bone from a carious cavity of a lower molar, not due to the diplococcus of pneumonia, which is so frequently encountered. Indeed I was at first of the opinion that the diplococcus pneumoniæ was the primary cause, perhaps driven out by other organisms; but as the former was never isolated, one would have lit-

tient's life. Certainly, nothing short of resection of the entire area of the bone involved would have resulted in a cure without complications in this patient. (3) The partial dislocation, or rather pulling of the jaw toward the side operated upon, resulting from tonic contraction due to inflammatory irritation of muscles, was at first very difficult and in fact impossible to control with any of the head and jaw appliances tried. Na-

a FIG. 4.



b

a, Ramus and articulating surface, showing coronoid process destroyed and necrosis almost into the articulating surface. *b*, Pieces of alveolar process removed at the dentist's office.

tle foundation for that belief. Speaking of the diplococcus pneumoniæ I would say that I find this organism not only in most cases of osteomyelitis of the jaw, but also in the large majority of acute ear abscess with discharge, and in many cases of so-called "cold in the head" and sore throat which, were it not for a microscopical examination, would ordinarily pass for "la grippe." (2) As the necessary extraction of teeth and even the removal of large pieces of necrotic bone had little effect on the progress of the disease, it was quite clear that a radical operation of some description was fully justified in order to save as much of the mandible as possible, and perhaps even the pa-

ture fortunately after a short time entirely relieved any tendency to lateral displacement. This is not always the case, however, as some permanent deformity often results. (4) The entire absence of deformity or any interference with normal mastication was indeed a most happy ending. In this the operator is to be especially congratulated.

I should like to briefly outline another case of acute osteomyelitis which is at present under my care, and which may prove interesting; also a second case that was discharged as cured some time ago:

Case I. Patient, male, twenty-seven years of age, gave a history of an upper left central in-

cisor having been filled in January 1909. The tooth had also been pivoted some two years before, with resulting alveolar abscess of short duration. Two months after the last dental treatment, the patient complained of pain about the tooth, and the dentist, Dr. Sheridan of Dubuque, noticed that the tissues over the alveolus were reddened and much swollen. The gum was immediately lanced both anteriorly and posteriorly. In spite of what appeared to be good drainage and appropriate palliative treatment, the swelling continued along the jaw line, involving the cheek. All of the teeth back to the molars on both sides became loose in their sockets, and a copious discharge of pus was noticed from multiple openings. The patient being seriously ill, was confined to bed. Gradually, as the acute stage passed, the teeth began to tighten, and the discharging fistulæ closed with the exception of three. When I first saw the patient on June 10, 1909, the whole alveolar process in front, and especially on the left side, was inflamed, spongy, and tender, and the teeth were exceedingly loose. There were three discharging fistulæ, one in the median line on the hard palate one inch posteriorly to the teeth, a second one over the left central incisor, and a third one in the region of the left second bicuspid. These openings all communicated with one another in various directions throughout the alveolar process. A culture made proved the pneumococcus to be the infecting organism. The question at once to be met was what form of surgical treatment —that is, a limited operation under local cocain anesthesia or a more extensive operation under a general anesthetic—would be apt to give the speediest relief. As the patient refused to take a general anesthetic, an incision was made under cocain anesthesia through the mucous membrane and periosteum of the hard palate, and much carious bone was removed, extending quite deeply, nearly to the floor of the nose. Both fistulæ over the teeth on the anterior alveolar border were also opened, and all pus, granulation tissue, and loose necrotic bone were thoroughly curetted out. Nature at once took care of the palate suppuration and caries, as the old fistula healed promptly and gave no further trouble. The other two openings in the alveolar process also showed a marked tendency to heal by granulation, and the entire jaw line assumed a healthier appearance, and the edema subsided. The fistula over the left incisor is now practically healed, and the other is fast healing. All this has fortunately been accomplished with the extraction of but one tooth, and without any risk to the patient. I may say that in this case opsonic treatment with pneumococcus serum, and the Bier hyperemia treatment as well, failed to give any decided benefit.

Speaking of jaw necrosis in general, it seems to me that the best treatment of any discharging sinus on the alveolar border, of either acute or chronic duration, can be promptly cured in practically every case by exposure of the sinus and curetting away the diseased bone. Often these carious tracts extend much farther than we suspect, and radical treatment is the only rational procedure.

Case II. Diagnosis: Chronic osteomyelitis with carious fistula. The patient was a female, thirty years of age, with a fistula anteriorly over an extracted upper left lateral incisor, the fistula having discharged steadily for ten years. A slender probe passed upward and toward the median line encountered gritty, carious bone deeply within the alveolar process. Repeated and light burrings and scrapings administered by dentists and physicians had failed to establish a cure. An X-ray picture which I had taken showed areas of caries, but no unextracted tooth-root. Treatment by injections of paraffin and bismuth mixtures did not improve the conditions present, but always caused intense pain, which lasted for some time. Under general anesthesia with chloroform the upper lip was retracted, and an incision was made along the labio-gingival margin down to the bone. The fistulous tract was thoroughly exposed with chisels and bone curets, and a considerable amount of pus and carious bone about an old tooth-socket was curetted away. The cavity was packed with a strip of iodoform gauze, and the tissues were re-sutured. The wound healed, and recovery was prompt, the cure being permanent. In this case the patient had suffered from various gastro-intestinal disturbances, and also appendicitis with subsequent operation, which very likely were caused in part by swallowing the pus which had been constantly present in the mouth.

THE APPLICATION OF SUCCESSFUL BUSINESS PRINCIPLES IN DENTAL PRACTICE.

By W. G. EBERSOLE, M.D., D.D.S., Cleveland, Ohio.

(Read before the Pennsylvania State Dental Society, at its annual meeting, held in Pittsburg, July 29, 1909.)

I CONGRATULATE your society on having a committee with wisdom enough to select so important and timely a subject as "The Application of Successful Business Principles in Dental Practice." For quite a number of years I have been convinced that one of the greatest curses of the dental profession is and has been the failure of its members to properly value the service which they render to humanity. With a profession under-estimating its own value, how can you expect the public to give it the recognition it demands?

A second fault is our failure to appreciate the value and importance of the dollar, both before and after it comes into our hand.

As proof, let me recommend for study and careful consideration the words of your own Dr. Louis Jack in his masterly presentation of "The Economics of Dental Practice," read before the Academy of Stomatology, February 25, 1908, from which I will simply select one sentence —a statement which, coming from a man noted for his integrity, after more than fifty years of personal knowledge and experience with dentists and dentistry, and made while speaking of the dentists of one of the greatest cities in America, should bring every man of us up with a jerk: "All, with one exception, have died poor"! What an arraignment! It is high time the question of the business side be considered. Many thanks to Dr. Jack for his valuable contribution in this direction! In quoting his statement I follow the example of the editor of the *Dental Digest,* and I would here especially indorse that department in his journal called "Business-building," under which heading are presented some articles which no dentist can afford to miss.

The few thoughts I am presenting to you are based upon ten years of contact with the profession over the country, followed by almost twelve years in practice. Than dentistry no profession more needs instruction in proper business methods, and none stands so much in its own light or more obstructs advancement in this direction.

THE NEW RECRUIT—FROM THE BUSINESS SIDE.

In discussing the business side of the dental profession, we will start with the new recruit—the graduate just out of college. Think how little we ourselves knew about the business side of dentistry on the day we entered practice. Do the men coming from college today know any more? Could we begin again, and have at the start the knowledge we now have, how much better we could succeed!

The trouble is that we are all just about ready to pass to the great beyond before we know enough about the business side of dentistry to make a success of it. The knowledge comes too late to be of benefit. Therefore I contend that our colleges are at fault. I have naught to say of their requirements as to theory and practice. When a man leaves the best of our dental educational institutions, he is in a good condition to *learn* to treat and fill teeth. The colleges, in

the time given, can give but the underlying principles. The graduate knows something of how to treat, fill, and extract, but nothing of how to keep the records of the work done, what kind of fee to charge for the service rendered, or how to get it after he has made up his mind as to the amount he should receive. My first business proposition, therefore, is that the dental schools introduce into their curricula a thoroughly practical course of business instruction as pertaining to dental practice.

I shall never forget the feeling that came over me when, after years of labor to gain funds to educate myself and in obtaining the education, commencements were all over and I had gone home and was proudly presenting to my parents for inspection the two diplomas I had labored so long and so hard to secure, when, like a flash, the thought came: They are worthless except to show that I have met certain requirements of the laws;—for not a word, in all the instruction given, was there that would help me make a start in the professional world. After all these years I was simply ready to start a practice, but, as far as college instruction went, I knew naught of how to start or what to do after starting, as far as the business side of the question is concerned.

BEGINNING DENTAL PRACTICE.

Let us, then, take this young man from college. How shall he start?

He should select a good locality and find a suite of rooms at a reasonable rent and where he can be readily located, and, if in a city, where he can have hot and cold water, gas, electricity, compressed air, and janitor service. This should be had at from $25 to $30 per month, costing from $300 to $360 per year. He cannot afford to furnish an elaborate office, for he has to go in debt for what equipment he puts in. He can ill afford to furnish anything but a neat, well-appointed suite of rooms, equipped with the latest and best of everything. Let him get less if he must, but get the best when he buys the instruments that are to aid him in rendering his professional service. Beginning by getting cheap things leads to a cheap practice, and to always having that kind!

A man may safely start with an equipment and furnishings costing him from $800 to $1000; a beginner can get along with that amount judiciously invested, but he can do much better if he can put $1200 or $1500 into his equipment and furnishing.

Now our young graduate is ready to begin practice, and having much time on his hands which is worth much to him, but which so far as the public is concerned is worth nothing, that valuable time must go begging until he can make the public realize his worth, but when there is a demand for it he can sell it for full value. How shall he create that demand?

By way of suggestion I would say to him, Suppose you call upon your professional brothers. In professional life the etiquette, so far as calls are concerned, is reversed from that governing the case in social life. The new-comer must make the first call. Therefore, call upon your neighbor dentists and invite them to call upon you. If they come and your office and equipment is as it should be, they will be favorably impressed and they will do one of two things:

If the caller be a broad man and a very busy one, with more to do than he can well handle—and the broad men are usually very busy—he will be inclined to send you his overflow. But if he be a narrow man he will fear you and your equipment, and he will immediately begin to work against you—begin "knocking" is the term generally used nowadays. Well, let him send his overflow, or begin "knocking"—in either case it will be a "boost," and though the latter will be a little slower than the first, the result will be the same in the end. Call upon them all, and don't be skeptical or supercilious. I was the thirteenth dentist in the block I started in. I called on all the others and only met one disgruntled and discouraging individual; he said I should starve to death, starting there! At that time I weighed one hundred and forty-

five pounds; I weigh one hundred and eighty-five pounds now—while he, poor fellow, gave up trying to practice three years ago. He was an utter failure.

Don't confine your calls to your dental neighbors, but get acquainted with the other tenants on the same floor with you or elsewhere. Get their good will. A cigar to the elevator man makes a friend; you need friends, you know, in starting.

In starting, get to your office before your neighbors do and stay later; you can afford to—you are not busy and can afford to stay. In this way you stand a fair chance to catch the fellow "who hasn't slept a wink with the toothache," or the fellow who "has had the toothache all day, but could not get away from business." And when they come, work for them regardless of whether they have money or not; they need the work and you need the experience.

When the demand upon your time is equal to the supply, then begin to raise your prices, until you can demand full compensation for the value of the services rendered. Until that time comes, keep busy working for patients, when possible, and when patients are not available, *work anyhow*. Do something, for your time is too valuable to be spent in idle waiting. If the public is not demanding the time, use it yourself in improving your skill, that you may render the better service when the demand comes.

AS TO WHY SOME ARE NOT BUSY: THE DENTIST HIMSELF.

From this point forward, my remarks are addressed to the profession as a whole, except that to the man who having been in practice for a number of years is not busy, I would suggest that he follow the advice given to the young man: Get busy and keep busy, whether for patients or not. There is too much to be done, too much improvement being made and too much being accomplished in the dental world, for us to pass an idle moment during business hours. Activity begets activity, while idleness begets idleness. Court the former, but shun the latter, if you would be a success in the dental world. To go into an office and find the owner out or idle is a mighty poor recommendation. Take the question home: Would you have as much confidence in a man of this kind as you would have in one that was busy?

If you have been following the "get busy and keep busy" plan, and still do not have sufficient demand for your time to permit your charging for it at full value, then there is something else wrong. Let us start right at the bottom of things. Just stop and look yourself over. Take a good look; it won't harm you to study the picture.

Look the man over carefully. Is he such a man as pleases you, and one that is likely to please others? What of his hair? Is it nicely trimmed and neatly kept? What of the beard? Is it properly clipped, or do you shave every morning? Next study the mouth. What do you find there? Do you keep it pure and sweet, free from the odor of liquor or cigarettes? Are the teeth properly cared for and kept in a wholesome condition? and is that which comes from the mouth pure and sweet also?

How is the man dressed that you are looking at? Is his linen clean and neat and is it changed often enough to keep it free from the odor of perspiration? How about that suit? Is it free from spots and neatly pressed? And the feet, don't forget them! their proper care goes to make up the whole. And the hands—we almost forget the hands! Are they properly groomed?—the nails carefully manicured?

We have covered the outside; look to the inside for a moment. Is the mind clean and wholesome, and is the heart pure and filled with love and sympathy for humanity?

On the whole, are you pleased with the man? If there is no fault with him as you find him, if he is a man that you would like to have work over those you love most, then we must look elsewhere for a reason for the failure to command the compensation one should receive for his time. Are your associates people who tend to lift you up in the world, or do they tend to pull you down? Look to

this point; it may be the key to the situation.

But I hear someone say, "I thought it was business methods you were to present." Yes, my friend, but before I attempt to tell you how to dispose of your goods I must take an inventory, as every successful business man does. I can't tell why your goods do not sell until I have looked them over to find whether they are damaged or shoddy stock. Fancy prices cannot be obtained for shopworn articles, no matter how great the demand.

THE DENTIST'S OFFICE.

We have looked the man over thoroughly, now let us look at the dental office—our own office, if you please. I have looked over mine since beginning to write this, and have decided upon several changes. Just step into the reception room, take off your hat and look around, just as you would do if you were a stranger. You are a prospective patient now, desirous of having dental service rendered, under thoroughly hygienic conditions. Are the things that meet your vision such as would impress you with the idea that the proprietor of that office was a thoroughly up-to-date man and one that could and would do the kind of work you are seeking?

The office must be no hole-in-the-wall that cannot be made either convenient or inviting. It may be necessary to economize to a certain extent, but you can't afford to try to make use of a place that cannot be made convenient and cannot be made to look neat and inviting. In furnishing and equipping an office, furnish and equip with the best; every dollar invested here will return the investment many-fold.

What kind of a young lady meets you? Does she look as though things were prospering here? *Employ a lady assistant you must.* No patient is willing to pay you the value of your time if you spend a good part of it in caring for your instruments and doing things that a cheap girl can and will do better than you can. Then, again, there is always that feeling that if you do these things yourself, you may be tempted to overlook some of the nice things that go to make a thorough hygienic practice.

Get a good lady assistant and then keep her busy—she is a mighty good investment; I employ three in my office, a secretary, a nurse, and a graduate dentist, and they are all high-salaried girls too. I started with one eleven years ago, at a time when to pay the salary that I paid meant the robbing of my family and myself of some of the things that most people consider necessities of life, but I employed and paid her just the same.

Now step into the operating room and look it over carefully. Are there signs here of prosperity and progression or of indolence and decay? Does this room meet the requirements of your now critical eye? If so, then have the young lady assistant put you in the chair and prepare you for the doctor to begin his work. Wait a minute—what kind of linen is she using? Is it a towel that looks as though it had been used for another patient, or is it a nice fresh napkin of good quality and ironed perfectly?

Someone says, "I use 'red cross' paper napkins on my bracket." Yes, so do we, but we use them under the napkin. We use three napkins at least, whether the patient sits in the chair five minutes or two hours, one over the breast, one over the head-rest, and one on the bracket, and a napkin once used, no matter if it simply comes in contact with the clothing of the patient, is never used again until after it is laundered; that is an absolute rule. Plenty of clean and nicely ironed towels are also kept convenient for the use of the patient at the end of the appointment or engagement.

What kind of instruments are those she places upon the bracket? Do you think the operator can do good work with them? All instruments should be kept as clean and bright as possible; one of the most important to be considered is the mouth-mirror. Many a perfectly clean and aseptic mouth-mirror has been the means of driving away patients, simply because the polished surface of that mirror has been damaged by the touch of a stone or sandpaper disk, mar-

ring it in such a manner that patients are liable to mistake it for an unclean instrument. Look to these mirrors well and carefully, for, of all the instruments placed upon the bracket, this is the one that the patient is most liable to handle, and if marred it will be the most deceptive.

But someone says that he cannot afford to have all these things. You cannot afford to do without them! No successful merchant displays his goods at a disadvantage. Go out to buy a good article of any kind, where you have to rely on the knowledge of the merchant, and buy it at a cheap, ill-kept place—if you will, at a low price—are you ever quite satisfied?

There is much I would like to say here about the office, its equipment and management, but I cannot stop to do so and say other things which are of greater importance coming under our title. But there are a few things I must say on the subject right here, or my paper would be incomplete. Fifty per cent. of the men who are failures, fail before they reach the patient in the chair. And the failure is due to carelessness in the appearance either of the operator or his office.

AT THE CHAIR.

We are now ready to begin our work at the chair. There is much that I would like to say from this standpoint, but the subject is entirely too broad for me to take that question up in connection with the business side of dental practice.

We have spent the time, thus far, in getting our "goods" and in preparing them for the public; now we step to the chair to make the examination and are ready to make the sale of the goods. Our examination shows what the patient is in need of. It is at this point that we enter into a bargain, either direct or implied. You point out to the patient his needs and the class of goods which would meet those needs, and the patient tells you whether he desires that which you propose to give him. It is at this point, many times, where the question of fees is to be considered, and it is here that much of the uncertainty of the future can be eliminated, as far as fees are concerned. Right here is a point where the work of educating the public must be done.

As stated earlier in the paper, our profession does not place proper value upon the service rendered to humanity. My candid belief is that the vast majority of our members do not really know the actual value of first-class dental service. I will go a step farther, and say that most of the profession do not realize what good dental service means—and I make this statement advisedly. Comparatively few men get beyond the teeth and gums. They simply fill, extract, or restore teeth and treat the gums. But we must know and teach more than this, and when the patient takes the chair for the first time is when much of the educational work must be done. The patient comes because he is having trouble and wants relief—anything will do, so long as he suffers no more. Take the time to teach the patient the importance of the teeth and the health of the mouth. Tell him that the dentist's business is not only to save the teeth, but to keep the mouth healthy. Impress upon him that filling and restoring teeth is only one means to this end, that your real mission is of a higher nature. You are an oral specialist, seeking to place and keep the oral cavity in perfect condition for rendering the service for which it was intended. Spend plenty of time in explaining the importance of perfect mastication upon the physical economy. Oh, there is so much to be said here, if only time would permit!

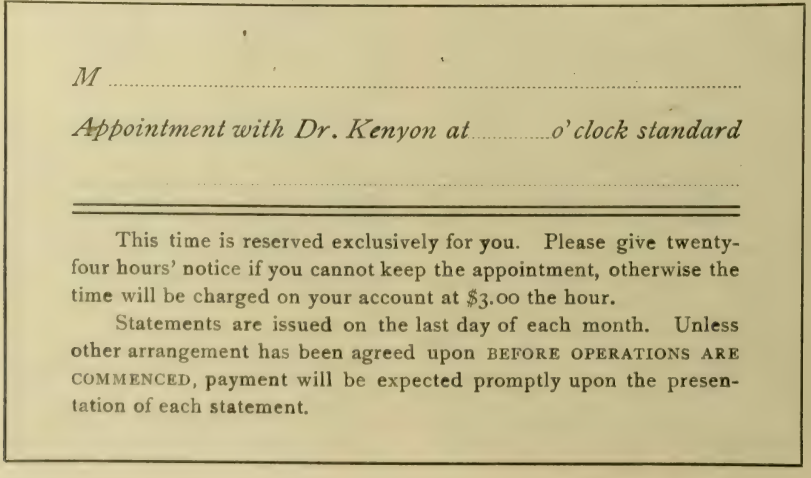
Learn to paint the picture as it is. The public must be made to realize the value of the service we render, not for our sake but for their sake. I care not what you tell the patient so long as it is the truth and raises their mental picture of the value they are receiving at our hands.

THE FINANCIAL RECOMPENSE.

I do not believe in making a definite price for any piece of work. If you state a

definite price, as I look upon it, it places a dentist in a very embarrassing position many times. When a definite price is mentioned for an individual piece of work, the dentist is very apt to mention a price, particularly if he is not overly busy, that is as low as the work can possibly be done with justice to all parties, provided that no unforeseen difficulties arise. If, however, some unforeseen condition does arise, and more time and work are required to finish a piece of work than we first anticipated, then we are placed in a position where we must do one of three things—we must charge a higher fee, or must do the work for the price named and as thoroughly as we had originally anticipated, and stand the loss ourselves, or we must slight the work in hand, thus doing an injury to the patient, as well as to ourselves in the long run.

Therefore, I would say to everyone, If you must state a price, make it simply an approximate one, stating that the fee may be greater or less, depending upon the time consumed in accomplishing results desired. If the patient accepts your terms, make an appointment, and give to your patient a card containing a statement of when and how payments are expected. As a form, I can do no better than to submit, for your consideration, an appointment card used by a friend of mine, Dr. H. C. Kenyon of Cleveland, Ohio, which is as follows:



M .....

Appointment with Dr. Kenyon at .....*o' clock standard*

.....

This time is reserved exclusively for you. Please give twenty-four hours' notice if you cannot keep the appointment, otherwise the time will be charged on your account at $3.00 the hour.

Statements are issued on the last day of each month. Unless other arrangement has been agreed upon BEFORE OPERATIONS ARE COMMENCED, payment will be expected promptly upon the presentation of each statement.

CARDINAL PRINCIPLES.

The sale has already been made; it remains, therefore, to deliver the goods. Naturally, as every successful business man takes into consideration the delivering of his goods in first-class condition, therefore the delivery, from the dental standpoint, has to be considered, as part of good business methods. With the dental profession this proves to be the most important part of our obligation to the public, therefore every man should adopt a motto to follow in connection with his practice—one that would always spur him to do his best. I will give you the one I adopted years ago, accompanying it with a slight explanation as to my interpretation of what it means: The motto is—"To live for humanity, but let humanity pay for the life." In the carrying out of this motto three cardinal principles have been closely followed: (1) Try to practice humanitarian and thoroughly sanitary dentistry. (2) Try to make each operation or piece of work just a little better than the last. (3) Try to receive just and full compensation for the service rendered. The first two are involved in the first clause of the motto, "Live for humanity," while the third is embraced in the second clause, "Let humanity pay for the life."

By humanitarian dentistry is meant dentistry wherein every method at our

command is used to not only prevent pain and suffering, but to prevent the fear of them. This is a most important principle; it causes the saving of more teeth than is possible by any other means, and as a business proposition this means much. Think first of the comfort of the patient; the thoroughness of the work secondly, and the size of the fee last; but base your charge upon the first two, however.

It is far better to have a less perfect piece of work, if it should be necessary, in one particular tooth, and save all the teeth of the patient, than to make a perfect operation in one tooth, and inflict so much pain and suffering in so doing that the patient not only neglects all other teeth, but tells all of his or her friends how terribly Dr. Do-it-perfect tortures his patients. It is not necessary, however, for the operator to sacrifice the thoroughness of the work in the least, if he will but adopt the methods which are at his command.

How to accomplish this kind of work time will not permit me to relate in detail; I will therefore simply refer you to a paper read before the New York Institute of Stomatology, January 5, 1909, "A Plea for More Humane Methods in Dentistry, with Suggestions for Practicing the Same," and to "Humanitarian Dentistry—What It Means and How to Practice It," read before the Odontological Society of Western Pennsylvania, November 12, 1907.

By sanitary dentistry is meant the execution of such methods as will not only give us sterilized instruments and materials used about the patient, but a clean, tidy, and inviting-looking office, with an operator clean and neat in dress, clean in body and pure in mind. It matters but little how careless the patients may be in the care of themselves, they appreciate cleanliness and purity in those who work for them. Many men who would have succeeded otherwise, fail here.

PICTURE OF AN UNTIDY OFFICE.

People dread the dental office at best, but when invited—or driven, as the case may be—to the dental office, think you that they will pay a good fee if they find, as is frequently the case, an untidy office, with instruments, soiled linen, old papers and magazines scattered and littered about with an accumulation of dirt and dust of days standing upon them? —the dentist with last week's mud still upon his shoes, trousers that are frayed at the bottom and bagging at the knees for the want of a few minutes spent with the needle and thread or with a hot smoothing-iron, and vest and operating coat covered with dirt, dust, plaster, wax, and, worst of all, blotches of blood as the result of yesterday or the day before's or last week's extraction, wearing linen that should have been cast off days before, and with a mouth fouled by tobacco and worse by cigarettes and liquor?

Place such a one in such an office and tell me if you think that patients compelled to submit to treatment surrounded by such conditions will pay good fees without a protest—whether such surroundings will obtain and hold a class of patients who can and will pay good prices.

Perhaps some may think this picture overdrawn. To such I will say that such cases do exist, and many of them. To the doubting brother let me say, Come with me and visit the dental offices in any of our cities, or go for a few days into the country and visit the offices of the country dentists. If the experience is new, you will be dumfounded at the frequency with which the picture described meets your vision.

ALWAYS ROOM FOR IMPROVEMENT.

But let us leave such an office and seek our own, and there let us look for possible improvement in this line. There are none of us perfect; there is always room for improvement. How many users of nitrous oxid have two hoods or face-pieces and sterilize one while using the other? Did you ever stop to think how foul these hoods must become with patients' offensive breath passing through them? And yet I had never seen or

heard of anyone taking means to thoroughly sterilize them until I mentioned the matter about eight years ago. How many place sponges saturated with formaldehyd throughout the office on Saturday night and close it tight until Monday, that the fumes may act upon the organisms that have accumulated? There are many things of this nature that would permit of improvement before we can claim to have reached the ideal from a sanitary standpoint.

In following the principle of trying to make each operation just a little better than the last, I will simply say that a man places himself in a position where he *must* advance. To advance in workmanship and skill means to give better service, and to give better service entitles one to command higher prices, all else being equal.

Thus far we have discussed the side of the question which would entitle us to a higher fee; now let us discuss the fee question itself.

"Let humanity pay for the life." In giving a life to a cause or profession, it is but just that those receiving the benefit from the life should pay for it at its par value. From the professional standpoint the financial part has been and should be a secondary consideration, but it is by no means the least in importance. Love of humanity and love of the profession is all good and well; but to do this and forget the dollar means to forget that which is essential to complete success. Knowledge and skill are stores of wealth, if properly applied; but both the profession and the laity largely judge your knowledge and work by the number of dollars you are able to command for them. If you have certain theories to advance, certain methods to advocate, first prove that they will bring in the dollars, and the world will listen and respect you and your teachings.

There is something radically wrong with the man who claims that he is simply working for the good or for the love of the profession and thinks but little of the financial side of the question. A man of that kind, though he be honest in his convictions, and though he be a good operator, yet does both himself and the profession a great injustice when he forgets to make a reasonable charge for his services. Do not sacrifice the work to get the dollar; and, *if busy*, do not sacrifice the dollar to get the work.

ESTIMATING CHARGES FOR SERVICES RENDERED.

We have now arrived at the question of value of service in actual dollars and cents. How should we estimate charges for the service rendered? To my mind, and I believe most successful men agree with me, the only just way is to charge by the hour. This is the fairest method when considered from all points of view. How shall we estimate this value? Let us start with the young man just out of college and figure from this standpoint to the man who has practiced many busy years.

Someone has figured that it costs a dental student $500 per year to go to dental college, and that his time was worth an equivalent; this makes the investment $1000 per year. Now if the recent graduate is a man who has taken the medical course also (and some men are doing this), then we must add two years more at $1000 per year, which makes the investment of the D.D.S., at the time he leaves college, $3000, and of the D.D.S., M.D., $5000. To this we must add the amounts that earlier in the paper we estimated it would cost to equip and furnish an office—from $800 to $1500. This would make an investment of from $2800 to $6500. We must figure to pay back a part of this each year. Say that we want to pay this amount back in five years; then we must earn 20 per cent. each year. Let us split the difference between the two estimates and say we have used $5000 in obtaining the education; then we must figure on earning $1000 on the investment per year. Then we must figure on all other expenses and we have a table something like this:

20% on investment	$1000.00
Office rent ($300 to $360), say	330.00
Lady assistant	350.00
Telephone	50.00
Laundry	50.00
Supplies at $1 per day	300.00
First year's salary at twice the cost of going to college	1000.00
Should earn the first year if we make money to start with	$3080.00

After deducting the Sundays and two weeks for vacation we have left 300 days for work at eight hours per day (I work more than that now)—we have 2400 hours in which to earn $3080; 2400 is contained in 3080, 1.28 times. Therefore, if you work every hour, you would have to earn $1.28 per hour, but you can't work every hour, and more than that, if you can get anything per hour, you should charge not less than $1.50, for you will get it just as easy as $1.28, so make $1.50 per hour your minimum charge. Remember, I am speaking of the beginner, his first year in practice, and that, too, under the values as established by the present method of practicing. I am absolutely opposed to such fees. Such fees are less than the plumber or bricklayer receives, when the investment in education and equipment are considered; I paid seventy-five cents per hour to have brick laid in building my residence. They got that price because the demand for masons was so great. The demand upon the young dentist is not great, therefore start with $1.50 per hour if you must, but keep building both in skill and fees until you can command $10 per hour; it is none too much, and the day is coming when the *good* men of the profession will charge more rather than less.

COLLECTING ACCOUNTS.

Starting with an understanding as to when and how you are to receive your fees (and this should always be the case) simplifies the matter of collecting very much. Make a note of the understanding on the margin of the account, and then see that these conditions are fulfilled to the letter.

I present herewith my method of sending statements:

OFFICE, 800 SCHOFIELD BUILDING
COR. EUCLID AVENUE AND ERIE STREET
PHONES { BELL MAIN 3704 / CUY. CENT. 5510-W
HOURS: 8 TO 12 1 TO 5

No. CLEVELAND, O., 190

M

TO DR. W. G. EBERSOLE, DR.

FOR PROFESSIONAL SERVICES FOR

FROM 190 TO 190 $

CREDITS $

BALANCE DUE $

RECEIVED PAYMENT M.D., D.D.S.

NOTE

Statements are mailed on the first of each month for all services rendered prior to that time. The best business principles demand prompt payment of all bills. We have adopted these principles and earnestly solicit prompt attention to our statements.

Notice the footnotes; the fault with them is that they are not strong enough. When these forms are used up, I shall

make a change in the footnotes which will state conditions under which service is rendered, and that payment *must* be made by a definite date. Then if it is not made, my secretary will see why it is not made at that time.

My weakest point in collecting is the present form of appointment card. New cards will contain, under blank space for date and hour of appointment, in good-sized type, the statement—

See other side for statement of conditions under which appointments are made and service rendered.

The other side will contain the following:

The time indicated on the other side of this card has been reserved especially for you, and twenty-four hours' notice must be given of inability to keep the same, or a charge of $5 per hour will be made for lost time. All fees for service rendered are due at the end of sitting, and if not paid a statement will be rendered on the first of the month for service rendered prior to that time, and *must* be paid at that time. Those expecting or requiring any deviation from the above must so state prior to the rendering of the service.

In using a card of this kind have the statement refer to the conditions on the card, and then enforce the fulfilment of these conditions.

Do not mail itemized statements. Patients will not understand or interpret them correctly. Besides, you are not selling treatments, fillings, crowns or bridges. It is time and service that you are charging for by the hour. If a patient asks for itemized statement, simply send him a statement, saying, Such a day, to service rendered so many hours—and on each day so many hours, and state that if there is any question about what was done on those days you have a complete record in the office of the work done, and will be glad to go over it with him if he so desires.

Bad accounts. The man who has been practicing for a number of years need not have many of these, through the process of weeding-out, but the rest of us, who are going through the weeding, get a few, and many times from quarters where we least expect them. I know of no perfectly satisfactory method of collecting them.

SAVING MONEY, ONCE WE GET IT.

Many men who are successful up to this point, fail here. As a rule, dentists are kind-hearted and open-handed to a fault—"just a happy-go-lucky bunch," notorious as easy marks for all promoters of "sure thing" or get-rich-quick schemes. This is a painfully true statement. Don't "stock" or invest in "good things." Of the hundreds investing but few make a gain. Put your money in a good savings bank and draw interest until you have enough to invest in good real estate which will rent for a definite amount. You may not make money as fast as some, but you won't lose it as quickly as most men do.

Remember, when tempted to invest in oil, mining, or other "sure thing" stock, that you are not a business man. Remember that "All, with one exception," who have gone before, in one of our largest cities, "have died poor"! Remember that for every scheme that shows a reasonable certainty of paying a return on the investment, there are a hundred business men, who have the time to devote to it, that are ready and willing to invest. And then remember that the very fact that you are approached with the proposition is, on the face of it, an indication that the thing is not worthy of consideration. In ninety-nine cases out of a hundred the salesman is looking for a "sucker," and is seeking waters where the kind of bait he has to cast has yielded the biggest catch. They have us spotted, and, much as I regret to acknowledge it, I must confess we seem to merit the name.

My story is told. In closing let me state that the theories presented were adopted after ten years' experience in calling upon the profession and studying the reasons for success or failure; now, after eleven years and over of practical experience in their use, they are given with the statement that I know their

value in my practice and in the practice of others. They have raised a country boy, a farmer's son, if you please, to the dignity of being selected by your committee to present "his business methods" to this great and august body of scientific men. He appreciates the honor.

A "clincher" and I have ended. I have been in the closest touch with, and have had the opportunity to examine the accounts of a man who has followed the principles set forth here, and when I tell you that this man's cash receipts for his practice for his tenth year was $14,000 and over, I know whereof I speak. Are not methods which, when applied to dentistry, will make it possible for a dentist to do a cash business of $14,000 in his tenth year in practice entitled to be entitled "successful business principles?"

SOME FALLACIES IN ORTHODONTIA.

By GLENN F. BOWMAN, D.D.S., Pittsburg, Pa.

(Read before the Pennsylvania State Dental Society, at its annual meeting, held at Pittsburg, June 29, 1909.)

CERTAIN fallacies persist year after year, apparently even growing stronger, until one comes to believe that they, like Antæus of old, gain strength each time they are thrown. It seems inevitable that each science should have its fallacies, which constant watchfulness alone can keep in check, and it is with no hope of eliminating them that this paper is written, but rather with the belief that reiteration helps, together with a fondness on the part of the writer—like Don Quixote—for attacking windmills as he sees them.

Etiology offers the most fertile field for false teaching, but treatment is not exempt, and the various theories advanced on the development of malocclusion and the different plans of treatment advised are so numerous as to make the consideration of any but the most important prohibitive in a paper of ordinary length.

For instance, you are all no doubt aware how frequently the patient afflicted with malocclusion is advised to wait until the teeth are erupted; to wait and see what nature will do, to wait until they are older; to wait, wait, wait, for anything and everything, while the malocclusion becomes complicated, the possibilities in treatment lessened, the facial bones deformed, the body stunted, and even the brain development retarded. It is either a very brave or a very ignorant man indeed who takes the responsibility of advising delay in the treatment of a developing malocclusion in view of the possibilities in the expansion of the deciduous arches, and it is altogether probable that the time is not far off when the development of anything like a complicated case of malocclusion in any given patient's mouth will be a serious reflection on the dentist having the mouth in charge; already it is a matter of reproach to our profession that there are so many well-developed cases.

It ought to require no argument to show the absurdity of a teaching which looks not toward the prevention of a deformity of the human body, but toward its encouragement; one cannot easily imagine a surgeon advising delay in the treatment of a developing spinal curvature or delaying operation in talipes.

Intelligent practitioners must surely recognize that the prevention of any abnormality in the human body is infinitely better than its correction; if, however, it were but a matter of delay in the treat-

ment of these cases, little could be said, but it is only during the years of active growth that one can hope to get the best results in orthodontia, the years rapidly increasing the difficulties of treatment and decreasing the possibilities in results. It needs but superficial study to convince one that this must be true, for in malocclusion it is not the mandible and maxillary bones alone which are affected, but to a greater or less degree all the bones of the face suffer, and it is only during the years of rapid growth that we need expect retarded development to be overcome; even though the teeth be placed in normal occlusion later, the patient must go through life with a more or less distorted physiognomy, and the responsibility should be placed squarely where it belongs, *i.e.* on the man who advised delay in treatment.

While the last few years have shown the effect of Dr. Angle's teaching, that it is "only when we have a full complement of teeth present and each tooth occupying its normal position—normal occlusion—that the best balance, the best harmony, the best proportion of the mouth in its relations to the other features is possible;" yet even now men are persistently extracting teeth in an attempt to correct malocclusion, as every orthodontist will testify.

There is perhaps some excuse for the followers of this false teaching, for it is given countenance in text-books on orthodontia, and even in the latest work to be published the writer over and over again gives his approval to the doctrine of normal occlusion, and then coolly recommends the extraction of teeth where, in the operator's opinion, the contour of the face demands it, utterly ignoring the inconsistency of the two positions, and further ignoring the teaching of leading artists that there can be no set rules for measuring the harmony of a given face—few artists, even, ever mastering facial balance.

If, therefore, artists are often unable to agree or determine proper harmony and balance of the facial features, how presumptuous it is for us to conclude that the extraction of this or that tooth will correct or improve some facial inharmony, more especially as it is impossible for anyone to foresee the exact changes that will take place in the contour of the facial bones in the course of a year or more following the establishment of normal occlusion on the one hand or the mutilation of the mouth on the other.

Acceptance of the mutilation theory first upsets the doctrine of normal occlusion, and secondly assumes that the facial bones, including the maxilla and mandible, will remain exactly as they were previously to extraction, forgetting that the changed distribution of force bearing upon the apices of the roots through the occlusal inclines must modify the contour of the face in the course of months or years. It would be interesting indeed to see accurately made models and photographs of these mutilated cases a few years after, and to note the various unpleasing lines developing in the face.

As Dr. Pullen has well pointed out: "In other branches of orthopedic surgery the morphological anatomy of the overlying soft tissues is not considered so essential and primary a diagnostic feature as the deformed structure of the underlying osseous structure; *e.g.* curvature of the spine and club-foot are diagnosed from a primary discernment of the abnormality of the bony tissues underneath. For the same reason, therefore, the facial lines are dependent upon the osseous structure of the face, the foundation and relative position of maxilla and mandible, and the teeth and their processes, for their harmony or inharmony of form, and a reversal of this natural order of etiological characteristics would be an absurdity; consequently, faulty facial lines should be regarded as symptoms rather than causes of an existing deformity of the osseous structure underneath."

Admitting the foregoing to be even approximately true, it at once becomes obvious that the extraction of teeth (aside from supernumerary teeth) in a child's mouth for the purpose of treating an existing malocclusion is inexcusable and cannot be too strongly condemned. That it may be necessary occasionally to ex-

tract in an adult's mouth is possible, but such cases must be rare indeed. The writer has never seen a case in which he believed extraction would be of any benefit. Certain it is that no one is justified in resorting to extraction without first submitting his opinion to the review of a competent consultant.

Next in importance comes the fallacy of heredity, with its various ramifications. You all, no doubt, have heard the ancient absurdity of "the inheritance of the small jaws of the one and the large teeth of the other parent," or *vice versa.* Most of us had imagined that this old acquaintance had been decently interred some time ago, but it seems worthy of mention, as the author of a late book gives it space, with illustrations of models, etc., and it is possible that its revival may find some acceptance.

Even if we grant that nature does produce freaks, we insist that the evidence so far offered in substantiation of the above-mentioned fallacy is far from conclusive, the "large teeth and small jaws" invariably showing more or less contraction of the arches with a resulting bunching of the teeth, while in the reverse condition, "large jaws and small teeth," the evidence is even less convincing, until one wonders why heredity is dragged in at all, when food habits, environment, tongue habits, etc., offer a far more logical explanation. It is perhaps superfluous to call attention to the rarity of a child being born with the large toes of one and the small feet of the other parent, or the large head of one and the small body of the other.

Again, in classes II and III, Angle's classification, which are characterized by distal and mesial occlusion of the mandibular arches respectively, we are told that one or the other parent had teeth exactly like the child. Therefore long-suffering heredity must again be the goat accountable for the positions of the teeth on the one hand and the discouraging of treatment on the other—for if the case is inherited, it is obviously useless to treat.

Such ideas are so largely accepted by the profession that it is well worth while to again call your attention to some of the known facts concerning the etiology of these cases. First, typical class II, division 1, cases—which are characterized by an undeveloped mandible with the teeth in distal occlusion and a narrowed, elongated upper arch with protrusion of the anterior teeth, and which are usually cited as hereditary—are always caused by mouth-breathing.

It makes no difference whether the nasal occlusion consists in hypertrophied pharyngeal or faucial tonsils, hypertrophied turbinates, chronic hypertrophied rhinitis, or any of the other forms of obstruction, if it is present at the right time, *i.e.* at or before the eruption and locking of the first permanent molars, the result, namely, distal occlusion of the teeth of the mandible with the resultant and typical facial deformity, is the same, and the forces which work this havoc and the manner of their operation are so well understood as to make it idle to doubt it.

If it were possible to obstruct the nasal passages of a child at the proper age, the development of this form of malocclusion would be inevitable. In class III, as Dr. Angle pointed out, a large number of these patients suffer or have suffered from hypertrophy of the faucial tonsils, and it is altogether probable that this accounts for the majority of these cases, the little patients seemingly finding some relief from muscular pressure on the sore and swollen masses by thrusting forward the mandible, until finally the cusps lock in that position.

Dr. Dewey has called attention to the probability of rickets being an etiological factor in these cases. Whether we have solved or finally do solve their etiology, it is a pretty safe statement that heredity plays no part, for it is a well-accepted theory today that acquired characteristics are not transmissible.

The matter of rapidity of treatment is another stumblingblock, one of the most common questions being, "How long did it take you?" Even admitting that time is an important factor in treatment, it is only relatively so, and has been given entirely too much prominence in the past.

Malocclusion is practically always accompanied by lack of development, and when the physiology of tooth movement is understood, it is seen that rapidity of treatment is often undesirable, for nothing is so stimulating to nature in her efforts to build the needed bone as the irritation of the gently applied pressure in tooth movement. Besides, both the infliction of pain and the period of retention will be found to bear a direct relation to the rapidity with which the movement is carried on, to say nothing of the patient's discomfort from trying to masticate with the teeth tender to the slightest touch and the always present menace to the pulps. In this connection it might not be out of place to state that the infliction of pain or even marked discomfort in tooth movement is not only unnecessary but inexcusable.

Last but not least come the fallacies of retention. Almost a book could be written on this phase alone, but it must suffice to call your attention to the current beliefs, first, that retention is simple, and second, that a case is complete when the tooth movement is over. On the contrary, retention presents the most difficult problems in orthodontia, and one might almost say the difficulties have only commenced when the stage of retention is reached.

The difficulties of tooth movement have practically been solved; teeth may be moved almost anywhere in the mouth by the use of delicately constructed mechanical appliances, but the problem of retention still rises up to make the nights of the orthodontist uneasy, and it is not exaggerating to say that the question one should most properly consider when studying a given case is not, "Can I move the teeth?" but rather "Can I retain them?"—and the treatment of many cases cannot be encouraged because the retention is prohibitive.

As stated in the beginning, the writer has no hope that this paper will stop men from advising delay in treatment, from extracting, from attributing the development of malocclusion to heredity, etc.; but if any written words of mine save even one child from the mental suffering and physical handicap of a distorted physiognomy, I shall feel well repaid.

DISEASED ROOTS AND DEVITALIZED TEETH.

By ISIDORE LETT, D.D.S., Boston, Mass.

(Read before the Lowell Dental Society, November 2, 1909.)

THE subject of conservation and extraction of teeth or roots demands important consideration. Cases occur in which it is absolutely necessary to preserve a tooth or root as a bridge abutment or for some mechanical attachment. Of numerous cases treated, a limited number illustrating extreme conditions will be described. Three points are to be considered in dealing with such cases.

First: The condition of the teeth or roots irrespective of the surrounding tissues.

Second: The condition of the adjacent hard and soft tissues.

Third: The physical condition of patients with a specific history, syphilis and tuberculosis to be noted especially.

The possibility of perforation of the antral floor by the root presents a delicate problem. The success of the preservation of teeth can only be judged years hence, a short trial of three or four years not being sufficient. Since it is a well-established fact that after the age of forty-five resistance and vitality decrease,

important consideration should be given to the patient's age. Much risk is taken in saving perforated or badly diseased roots. Often all track of such cases is lost. Both benign and malignant conditions are caused by those apparently saved teeth. The original work may have been skilfully performed, and for several years may have given excellent satisfaction. It is known that a benign tumor from a diseased tooth will for one mouth remain benign, and in another eventually become malignant. Since the cause of cancer in its various forms has not yet been ascertained, the possibility of malignantly developing epulis cannot be overlooked. The death of the pericementum frequently causes epulis, especially if a root is deeply embedded in a dense alveolar process.

A sinus established in order to preserve a tooth may never prove troublesome, yet it is possible that it may cause disturbances after the patient has passed middle life. Should a degeneration of the tissues along the track of the sinus ensue, the condition would change from a benign to a malignant one. For example:

Case I. A woman, fifty-three years of age, was troubled with loosening of the lower incisors. The teeth were scaled and general prophylactic treatment was applied. Later, presumably owing to irritation, hypertrophy of the cervical tissue ensued. Silver nitrate was employed without producing any effect at the end of several weeks, whereupon the case was referred to me. The hypertrophy, though not especially marked, presented an inflamed surface with distended vessels. The microscopic examination of a small excised piece revealed carcinoma. The patient would not submit to an immediate operation. Two months later I was summoned, ostensibly to operate, and found the jaws distended and the mouth entirely filled with a carcinomatous growth of soft tissue. All cervical glands were very much enlarged. An operation for the purpose of temporary relief only was performed, enough growth being removed to allow the closing of the jaws and deglutition. The patient died eight weeks later from general septicemia.

Case II. In a man, forty-five years of age, an attempt had been made to save an upper canine. In endeavoring to drill out the root-canal, a perforation had been made. This perforation had been closed and the root filled. The tooth gave no discomfort for a number of years, until the patient came to me complaining of a dull ache in that location. Examination disclosed necrosed bone around the root of the tooth. The microscope revealed osteosarcoma. By an operation the tooth, all diseased tissue, and considerable healthy tissue beyond the diseased area was removed. Two years later I examined the patient's mouth and found no disturbance. The patient was advised to have future examinations made in case the tissue should show signs of degeneration, rendering a second and immediate operation necessary.

Case III. In a child of eight years an attempt was made to save the abscessed upper left first molar. Infection of the bone followed, and the tooth was extracted. An examination of the case a few days later revealed osseous necrosis, extending along the whole upper left maxillary bone, and involving the inferior turbinate. A temperature of 104° rendered the child delirious, his condition becoming precarious. By an immediate operation the greater part of the maxillary bone and the inferior turbinate were removed.

Case IV. A boy of twenty, with tuberculosis of the lungs and a tubercular hip, was treated for a putrescent pulp in a lower right molar. While an attempt was made to save this tooth an abscess developed, necessitating the extraction of the tooth. When the case came under my observation, necrosed bone was in evidence as far back as the ramus. I operated at once, curetted the bone very deeply, and disclosed an unerupted third molar. The wound did not heal for almost four months. The patient died two years later of tuberculosis.

The following is a case in which it was feared that any attempt to preserve a tooth would prove unsuccessful:

Case V. A man desired to have crowned an upper second bicuspid root containing a putrescent pulp. After excavating the root-canal, an enlarged apical foramen was found in the antrum. Fearing infection of the antrum, extraction was advised. This was performed, with no subsequent involvement of the antrum. Had bacteria been present in the pericementum, empyema of the antrum would probably have resulted.

The following case illustrates the necessity of amputation of the apex of the root for conservation of the tooth. These cases are not uncommon:

Case VI. The lower left first bicuspid and second molar were present, both teeth being required for bridge abutments. The bicuspid had been unsuccessfully treated to cure a sinus through which pus was copiously discharging. Examination indicated the method of treatment, which was to cut down through the sinus, open up to the apex of the teeth, remove the apex, polish the amputated end, and apply the usual root-canal dressing. The incision should be packed until complete granulation has ensued. The sinus was closed, the tooth saved, and a bridge put on it after the lapse of a month. In this case it would have been impossible to save the tooth by root-canal treatment.

Unusual cases such as the foregoing serve to emphasize the fact that too much care cannot be exercised in inquiring into the patient's general health and family history.

CORRESPONDENCE.

IS DENTISTRY A SCIENCE?—AN OPEN LETTER TO DR. G. V. BLACK.

To Dr. G. V. Black, Chicago:

My dear Confrère,—At the thirteenth annual meeting of the National Dental Association, held at Birmingham, Ala., Dr. Grieves read a paper on "The Behavior of Certain Metals in the Mouth." (See Cosmos for September 1909.) In the discussion following the reading of this paper you also took part. (*Ibid.,* pp. 1087–89.)

I have chosen your remarks as the subject of this open letter, because the dental world listens to your voice as to that of an oracle, and is accustomed to regard your utterances as established facts without further scrutiny. Hence I am justified in considering your remarks as a measure of the scientific level of dental metallurgy, of which you are regarded as the ablest representative.

Every branch of science is built up of the knowledge of the smallest individual details of a series of subjects homogeneous by nature, just as a house is constructed of individual stones. Consequently we demand that every investigator who would claim scientific value for his efforts shall build up his investigations, *i.e.* his building stones, upon the foundation of already extant knowledge.

We must further demand that every new investigator shall examine the existing foundation as to the quality of its building stones, remove worthless material, and replace it by that which is good. Only knowledge built up in such a way may lay claim to the term science. All else is fragmentary, guesswork, and empirical.

When fourteen years ago your essays on amalgams appeared, they signalized a revolution in that field of our knowledge. I myself was probably one of the first to appropriate your results; yet even then I had grave doubts as to your methods of investigation, and the results of

my own practical experiments differed from yours. In the meantime my doubts have increased, and the successful development of physical chemistry and its results have rendered my scruples a certainty. Nevertheless I did not consider myself called upon to contradict you as long as you merely reported ascertained facts.

Your remarks in the above-mentioned discussion, however, contain the following passages, which make it my duty as a scientist to contradict you. Moreover, this is demanded by our interest in our specialty, the scientific character of which we are obliged to safeguard, as well as our self-respect and our reputation in the eyes of the representatives of physical chemistry.

You say on page 1087:

[1] "We know very little about alloys; there are some phases about metals, the most sensitive of all the elements, that we seem not to be able to understand. When we work with metals, it seems to me that they are living entities," etc. . . . [If we are] mixing them with each other . . . we never know what to expect."

[2] "Why mix gold and tin? These metals are incompatible and will not work well together, and will destroy each other."

[3] "Gold will not harden in mercury."

[4] "In alloy-making, an alloy is one thing and a mixture is another thing entirely."

[5] "This has been recently denied by some German investigators . . . upon purely theoretical grounds," etc.

First: Chemistry, especially inorganic chemistry, which concerns itself with the properties of the metals, has established the mutual influence of metals upon one another in binary as well as in many ternary and quaternary alloys with absolute certainty. Therefore, when you say: "We seem not to be able to understand" and "we never know what to expect," you can have meant by "we" only a majority of laymen. "We" metallurgists know exactly what happens when two metals alloy. If we do not know it, and if we lack literature upon a subject, we know the methods to determine what happens.

Second: "Gold and tin are incompatible." I cannot comprehend what you mean to say by that. If you mean that neither a chemical nor a physical affinity exists between the two, then gold, owing to its greater specific gravity, would have to sink, and the tin would have to solidify on top, just as oil and water separate.

But then it is again illogical to say: "They destroy each other." This is exactly as logical as speaking of a blind man with remarkable vision.

The conception of a mutual destruction of two substances is also so unusual that a representative of chemical science, upon reading this as a statement of the foremost dental metallurgist alive, would ask in astonishment, Does the dental profession have a chemical science and language of its own?

We know very well that two metals combine to form chemical combinations, eutectica, solid solutions, or mixed crystals. We know the polymorphous changes in crystals. We distinguish these according to how like or unlike atoms combine to form a molecule, like or unlike molecules combine to form a crystallite, like or unlike crystallites combine to form a crystal, like or unlike crystals combine to form a metallic union, etc. The case, however, that two substances "destroy" each other is a novelty.

A glance over the literature would have showed you that tin and gold are by no means incompatible, but form (1) The chemical combination AuSn; (2) the chemical combination $AuSn_2$; (3) the chemical combination $AuSn_4$; (4) two different mixed crystals, and (5) five different eutectica.

It is inconceivable how in the face of such facts established in our literature one can say: Gold and tin are incompatible and destroy each other.

Third: "Gold will not harden in mercury." (Cosmos, September 1909, page 1088.) Burchard (Cosmos 1895, page

991) already reports that the chemical combination Au_8Hg "is left as solid amalgam which crystallizes in four-sided prisms." This article of Burchard is the best that has been previously written on amalgams in dental literature, and I have already pointed out (Cosmos, January 1909) that you have entirely disregarded this valuable contribution, very much to the detriment of your own results.

The results of twenty-one more authors stand in contradiction to your above statement.

Fourth: "In alloy-making, an alloy is one thing and a mixture is another thing entirely." I have pointed out above that chemical and physical affinities must be distinguished. The latter are separable by physical means, such as, for instance, heat. If one is therefore able to melt the tin out of a tin-silver alloy in the manner described by you, this is no reason to deny to the mixture the character of an alloy. In my last article I have commented on the conditions of the tin-silver alloys at such length that I can dispense with a further explanation.

From your remarks I must presume that you have failed to follow the special literature of the last ten years, else you would not dismiss a whole science with the words, "This has been recently denied by some German authors, but they have based their denial upon purely theoretical grounds, and I demand that they prove it by actual alloying and weighing."

I hope that after this you will condescend to look into my articles published in the Dental Cosmos in 1908 and 1909. You will find then that we have not only been "weighing." We have communicated our results in complete volumetric, thermal, electrometric, etc., diagrams. We have examined and improved by microphotography the results of other methods, and do not make any statements unless based upon well-founded facts.

I am utterly unable to explain how in the face of such facts one may stigmatize us German investigators as theoretical fantasts.

Why am I writing this letter? Because I hope that it will be noticed by those men who have influence upon the welfare and the development of our specialty.

I trust that this letter will be an incentive toward having dental metallurgy no longer taught as a side issue by teachers who are not expert in it, but to have it treated as a science in the proper sense of the term.

In conclusion, I hope that you, my dear *confrère,* will receive this letter as it is intended, written simply to serve a good cause in an objective way.

Your activities and your success have hardly been admired with more undivided admiration and respect than by the writer of these lines. On the other hand, it is also natural that, considering your age, the pursuit of a more and more complicated science such as physical chemistry demands younger forces to build further upon the basis of your results that in their time were standard.

In doing so, some errors must be corrected. I myself have proved in my last article that I am gladly willing to rectify my own mistakes. But I cannot neglect this self-imposed duty in regard to others.

I close with the expression of my highest esteem.

Your devoted *confrère,*

Ad. Fenchel.

Hamburg, Ger.

REPLY TO DR. FENCHEL'S OPEN LETTER.

To Dr. A. Fenchel, Hamburg, Ger.:

Dear Doctor,—You have seen fit through the pages of the Dental Cosmos, present issue [see foregoing letter], to direct to me an open letter which bears a complaint regarding certain remarks I made at the thirteenth annual meeting of the National Dental Association, held at Birmingham, Ala., last March, and published in the Cosmos for September 1909, pp. 1087–88. These remarks were made in the discussion of a paper presented by Dr. Grieves on "The Behavior of Certain Metals in the Mouth" (Cosmos, September 1909, p. 1041).

In the opening of your letter you do me too much honor by referring to me as "an oracle to whom the profession listens," etc., whereas the fact seems to be that few men in dentistry have been so sharply and so persistently criticized as myself. While I have made some studies in special fields of metallurgy from the physical standpoint, which you have been pleased to notice, and have looked into some of those subtle influences surrounding the metals lying between the chemical and the physical (*Missouri Dental Journal,* 1869, p. 283, "Gold Foil"; also, "Gold," Cosmos, 1875, p. 138), I make no claim to very great information in the general field of metallurgy.

In the discussion of the paper referred to by you I was rather an accidental participant, called upon without notice after those appointed for the discussion were through. I was then kept on the floor for an hour answering a volley of questions propounded from all parts of the house. Many of the answers were in short, terse sentences; sometimes in greater detail. As usual in such irregular discussions, the reporter's copy came to me for correction with most of the questions left out, and otherwise in bad shape—for which, however, there is no good reason to blame the reporter.

Some months had elapsed to aid my forgetfulness of what had occurred, placing me in an embarrassing position for the correction of the report. I ran my pencil through much of it of which I was unable to recall the questions, and made an effort to form the remainder into readable shape, preserving the wording attributed to me as far as possible. On receiving your letter I did not remember that I had looked over this discussion after it appeared in the Dental Cosmos. But when I reviewed it I found in my writing a modification of one of the phrases of which you complain —regarding the mixing of tin and gold —making it read, "will destroy the *physical properties* of each other," instead of "destroy each other," as printed. However, it was printed as you have it. Some of the few questions which I endeavored to answer, that were in the report as I remember it, had been left out by the editor (sometimes it is difficult to know what should be done with such irregular discussions); and some answers to different questions had been run together, making incongruities calculated to mislead one as to my meaning. These I will severally explain as I notice them, individually.

These matters I should have been glad to explain to you privately had you given me the opportunity. I do not think, dear doctor, that had you fully understood the conditions, you would have written this open letter.

In your indictment against me in this open letter you make five counts, which I beg leave to discuss in the order in which you have given them. In doing this I shall quote each, or the beginning of each, in the words in which you have written them in this issue of the Dental Cosmos.

Count I. "We know very little about alloys. There are phases about the metals that we seem not to be able to understand," etc.

To this you enter objection, and in

general terms you contend that we do know about them.

I will only say of this that anyone who will review the literature carefully will find evidences in the disagreements of writers that will justify my remark; and in your articles to which you have referred me in your open letter we find that you are in disagreement with me, with our friend Dr. Hasse, and others; and in your article in the January 1909 Cosmos, p. 1, in your opening sentence you say of amalgam (an alloy that is generally imperfect, perhaps because of the failure of complete solution of all of the particles of the metal in the menstruum—mercury):

> The study of my last publication on amalgams (Cosmos, 1908, vol. 1, p. 553) has evidently made it clear even to the uninitiated that our knowledge of the internal processes in the formation of amalgam is still very limited.

If our knowledge of alloys were so satisfactory as you contend in your open letter, such disagreements and such remarks by you should not occur.

You should remember, dear doctor, that one man may properly announce what he has reason to believe is a fact in science, but that it requires the consensus of opinion of many workers in the particular field, after due examination of the subject-matter, to determine the fact. For instance, Mr. Lister announced that operative wounds, when protected from micro-organisms, would heal without the formation of pus. But this fact was subjected to separate examination and trial by hundreds of surgeons before it became established as controlling the working conditions in surgery.

Count II. "Why mix tin and gold? These metals are incompatible and will not work well together, and will destroy each other."

In this quotation from my discussion you object to the word "incompatible," and to the phrase "will destroy each other."

I notice that I have also used the word "incompatible" a few lines above the quotation you make, and I will show the context best by quoting the words I used:

> I cannot understand why very many alloy-makers insist on using two or three modifying metals in alloys, while they should use but one, using metals that are incompatible with each other. Why should we mix our solders with zinc? Why should men want to place amalgam in a cavity and put gold over it? Why mix gold and tin? These metals are incompatible and will not work well together, and will destroy each other. (Cosmos, September 1909, p. 1088.)

Here are three points to which the word "incompatible" applies: (1) Mixing too many metals in amalgam alloys. (2) Using zinc in gold solders. (3) Using amalgam in cavities and placing gold over it, and mixing together gold and tin foils in the same position. These were in part answers to direct questions while discussing Dr. Grieves' paper. I have used the word "incompatible" in the same sense that I would use it in regard to prescription-writing when warning students not to use drugs that are liable to form chemical combinations and in this way produce something not intended.

(1) I object particularly to the mixing of zinc in amalgam alloys because it seems to create disturbance by its chemical affinities; or the mixing of a number of metals, for the reason that disturbing chemical affinities are the more liable to occur.

(2) As to using zinc in gold solders, I was at the moment discussing the difficulties complained of by Dr. Grieves (Cosmos, September 1909, p. 1047) regarding the imperfections occurring in gold solders containing zinc. It has seemed to me that the zinc did not dissolve evenly in the other metals, and that it probably formed little islands of a composition readily affected chemically by something in the saliva, forming the pits complained of by Dr. Grieves (Cosmos, September 1909, p. 1044). However this may be, gold solders formed by alloying with silver and copper are more stable in the mouth. Anyway, after due trial I, years ago, refused to

use the gold solders in the market because of the objection to the zinc which was urged by Dr. Grieves in his paper.

(3) In this instance I used the word "incompatible" for the reason that gold and tin, when used in juxtaposition or folded together as foils, has so often been noted to combine, under some influence derived from the saliva possibly, and form a crystalline mass that is hard and brittle, crystals that waste out, or are easily disturbed. Dr. Grieves in his paper had made mention of the evil results of placing gold in juxtaposition with tin, in these words:

> Tin, the principal ingredient in amalgam alloys, when associated with gold cervically as foil, under the influence of the saliva loses much of its physical properties and becomes hard and brittle. (COSMOS, September 1909, p. 1047.)

I think that you will now understand what I meant by this word, especially as in your open letter you mention three formulæ of chemical combinations of gold and tin, two forms of mixed crystals, besides five eutectica (COSMOS, present issue, p. 197).

"Will destroy each other." In this instance you have made an extremely harsh criticism when you say (see the language of your letter)—"The conception of a mutual destruction of two substances," etc. You convey the idea that I was teaching that the chemical elements may suffer annihilation, or destruction used in this extreme sense—an idea that is repugnant to all thinking men. And you repeat this in a slightly different form in your next paragraph, in—"The case, however, that two substances 'destroy' each other is a novelty."

The word "destroy" is defined by the Standard dictionary as follows:

> I. To bring to ruin or demolish in any way; (1) To cause the downfall of; overthrow; as, to destroy an empire. (2) To tear down; wrench apart; knock or pull to pieces; as, to destroy a building. (3) To take away completely the value or usefulness of; vitiate; lay waste; as, to destroy one's reputation; to destroy a contract. (4) To put an end to the existence of; cause to cease to be; cut off; kill; as, to destroy weeds or noxious insects; to destroy one's peace of mind.
>
> II. To show to be false; disprove; as, Agnosticism destroys itself.

We see from this definition that the word "destroy" does not necessarily mean annihilation. Indeed, in the more common usage of the word it seldom means annihilation, except when applied to the destruction of life, animal or vegetable. We say iron is destroyed by rust. The Russian ships in the harbor at Port Arthur were destroyed by the Japanese, etc. No one supposes that the element iron is annihilated. Some, at least, of the ships said to be destroyed at Port Arthur are now doing duty, though they were so injured that, under the conditions, they were useless to the Russians—hence, *destroyed.*

The metals as a class are, in the metallic form, artificial substances. They occur in nature in chemical compounds. To this, platinum and gold are marked exceptions, being generally found free as metals. Silver, copper, mercury, and arsenic are sometimes found free as metals, but more often as chemical elements in combinations. (See Standard dictionary under "Element.") All other metals, as metals, are produced artificially by the isolation of chemical elements found in the rocks and soils. All of these, except gold and platinum, show, in different degrees, a constant tendency to return to the combined state when exposed to the normal elements and conditions of the outdoor world. When a man builds an iron fence he paints it to prevent it—the iron—from being *destroyed* by rust. If he places a metal roof, of any metal other than copper, on his house, he paints it to prevent the metal being *destroyed* by corrosion, and renews the painting at intervals. The housewife takes especial care of her metal ware to prevent *destruction* of the metal. In the use of implements and tools, made of the metals, constant care is necessary to prevent the metal from being *destroyed,* or so *injured* as to become useless. The word "destroy" is in common use in this sense.

This usage is covered in the definition given above, in—"1. To bring to ruin or demolish in any way; . . . 3. To take away completely the value or usefulness of." This is also shown authoritatively by its use in the following definition, which I quote from the Standard dictionary: "'Corrode.' To eat away gradually; rust; hence, to ruin or destroy little by little; disintegrate; as, an acid corrodes a metal."

Therefore, if the two metals, tin and silver, combine forming a crystalline mass totally different in physical properties, a new substance, in which condition it does not perform the functions intended—a thing that I have seen many times—I had a right to use the phrase as printed, "They destroy each other."

If you claim that the phrase was harsh, I admit it. If you claim that it was not the proper language of chemistry, I admit that also. But, doctor, strict chemical language was not employed either in the paper or by the speakers in the discussion who preceded me. Not a single chemical equation was given.

If you will look over Dr. Grieves' paper again, you may notice that he used the word "degenerate" to describe changes in the metals. Thus, Cosmos, September 1909, p. 1042: "It would be a waste of time to name the metals used in the mouth;" . . . "many in the salivary environment *degenerate* rapidly." *Ibid.*, p. 1044: "Gold (alloyed) with copper, silver, and platinum do not *degenerate* under the same conditions." *Ibid.*, p. 1048: "Gold *degenerates* in these cases." Can you conceive that he means that the chemical element, gold, *degenerates?* Or that any chemical element *degenerates?* Certainly not. But the metal, gold, the piece in hand, may become less suited to the purposes intended in many different ways. In any such case his use of the word "degenerate" is well within its proper meaning. Therefore an interpretation that he intended to teach that the chemical element gold, or other chemical elements, could degenerate, would be harsh in the extreme, because such a thing is believed to be impossible.

Count III. "Gold will not harden in mercury."

It seems to me very late in the development of science to deny this as a general proposition with reference to dental amalgams. Great search has been made to find some other metal to replace silver because of the sulfureting and blackening of that metal in the mouth, but none has been found. Every other metal available has been tried (Charles Tomes, *Trans. Odontological Society of Great Britain,* 1871) and none other has been found. An amalgam made by replacing the silver with gold does not harden sufficiently to be of service. Every gold-miner who has used mercury in his sluices to collect the gold knows that the cake of amalgam formed by wringing out the mercury does not become very hard.

Articles overlooked. In connection with this count you make complaint that I have overlooked important articles, and mention specifically the papers of Dr. Burchard. To this I will say that I knew that gentleman personally and always read what he wrote. But he wrote on the chemistry of alloys; I did not. I wrote on the physical character of alloys, and held to that closely. Therefore I had no occasion to quote his papers or those of any others who wrote purely from that standpoint.

Now, do not suppose for one minute that I decry the development in the chemistry of the metals in its relation to alloys. On the contrary, I had studied that phase of the subject carefully before, and have followed it with much interest during the years since. The future development in this field of research will certainly give us a better knowledge of the chemical affinities of the metals one for another, that will enable us to avoid those that disturb the physical properties of our alloys. But a man must spend his life in chemistry to keep fully abreast with *all* that is being developed. I am very closely engaged with other matters.

Count IV. "In alloy-making, an al-

loy is one thing and a mixture is another."

At the end of your discussion of this matter you also quote this: "This has been denied by some German authors on purely theoretical grounds, and I demand that they prove their denial by actual alloying and weighing." This latter quotation I shall discuss as *Count V.*

The first statement quoted above seems to me to be perfectly clear and correct. If you have not carefully contrasted the physical properties in amalgams obtained from unalloyed silver filings and unalloyed tin mixed together cold and combined with mercury, with amalgams obtained from well-made alloys of the same identical proportions of these metals, it seems to me better to refer you to the article on Amalgam in my recent work on "Operative Dentistry," 1908, vol. ii, p. 299, and especially to pages 307–8, where this particular matter is briefly explained. In the DENTAL COSMOS, 1896, p. 981, there is a statement of this in a single sentence only.

At the time of writing in 1896 I did not discuss this matter, for prudential reasons. Manufacturers were assisting me in every way they could, and were really giving me efficient aid. I was arousing quite enough criticism without at that time publishing the details of faults I found in the making of alloys that might possibly be interpreted as an attack upon certain men.

But certainly, doctor, if at the melting-point of tin I could shake large globules of melted tin out from an ingot of an alloy, leaving holes in it as big as buckshot, that tin had not been alloyed with the silver. Otherwise than this the alloy did not melt until many degrees higher temperature was obtained. I could not regard this as anything else than a mixture of unalloyed tin with the alloy. These imperfections in the making of alloys had confused my results, rendering them extremely irregular for given formulæ, and had caused me a long and rigorous search to find the cause. Finally, experiments in making and testing the physical properties of amalgams made from filings and unalloyed silver and unalloyed tin mixed together cold as filings, and of the c. p. precipitated metals, gave me the clue. Then the difficulty was readily cleared up. The lapse of time, as I now think, gives me liberty to speak of some of these matters without the offense a discussion of them in 1896 might have given. I must hold that my statement was correct.

Count V. "This has been denied by some German authors, but they have based their denial on purely theoretical grounds, and I demand that they prove their denial by actual alloying and weighing."

Further on, you say with reference to this quotation from my remarks:

> I am utterly unable to explain how in the face of such facts [as you relate] one may stigmatize us German investigators as theoretical fantasts.

This matter had nothing to do, properly speaking, with the discussion in hand, and would not have received mention by me had not a direct question been asked me regarding certain statements in an article written by you, and published in the January 1909 issue of the DENTAL COSMOS. This was done without mention of your name or the title of your article. I may say further that at the moment I could not recall either your name or the title of your article, and in the dilemma I probably said the words reported and allowed them to go to press. The words used are not what I would have said had I prepared to speak to that point by re-reading the paper mentioned. But remembering at the moment other papers, by German authors, I made use of the words "some German authors."

I am surprised that you should have used the words—"stigmatized us German authors as theoretical fantasts." My remark as quoted limits the phrase by the word "some" and certainly it could not apply to all, as I suppose you mean by the term "us." Then, is it a stigma upon anyone to say that he has written a theoretical or a speculative article on such a subject? I certainly do not think every man who writes theoretical articles should be spoken of as a fantast, or be

regarded as fantastic. Many such articles are excellent reading, and not infrequently very useful. Your own Baron Liebig held the scientific world bound for many years by his exposition of the vibration theory of the fermentations. Yet the scientific world knew perfectly that it was an unprovable theory. And withal it was extremely useful in putting into orderly form the manifest results of forces which at that time could not be explained. I therefore do not feel that I did stigmatize anyone by the use of the word "theoretical."

The title of your article mentioned, published in the DENTAL COSMOS for January 1909, is—"The Specific Volume of the Tin-Silver Alloys, and Its Application in the Approximate Analysis." In this paper you deal with a portion of my writing on alloys for amalgams, in which some original research on the above subject was made (COSMOS, 1896, pp. 979–981), comprising about two pages.

(1) In this paper you assume that the figures given as resulting from my experiments for the condensation which occurred were regarded by me as definite, conclusive, and final, or you deal with them as if they were so given, without any reference whatever to the variations in the results reported by me, or of the estimate I had myself placed upon their exactness. This estimate I have written on the same page, and only a few lines below the figures you have used in contradicting my statements (as you please to term it in your letter), in these words —beginning with a statement regarding one of my experiments:

> This is the worst of my losses of metal in casting, but others scatter along, and serve to throw doubts over the accuracy of the observations. Still, every ingot of the two series indicated a considerable condensation. It is only the exact amount of the condensation that seems to be in doubt. (COSMOS, 1896, p. 980.)

It therefore appears that when what I have really claimed is compared with the results you have depicted in your diagram (COSMOS, January 1909, p. 3), your work has really been in large degree a confirmation of mine, instead of a contradiction as you have stated.

Now, my dear doctor, this procedure on your part seems to have been very unfair to yourself, because it places you in a bad light to anyone who may take the interest to look up an article written fourteen years ago. Again, it is unfair to me, because very many of my friends who may read your paper may not have my articles written fourteen years ago at hand, or endeavor to verify the accuracy of your statement. It is unfair also to the development of science, which we all wish to promote.

(2) Furthermore, in your article (COSMOS 1909, p. 1) you have cast aside my figures giving the mean specific gravity of the metals weighed into the crucible, and selected specific gravities given by others for tin and for silver, namely, "Pinner and Kraft," instead—figures that differed sufficiently from mine to make my results appear incorrect; and in this way, as you say, you have contradicted my statements.

I was much surprised when I read your article, the last mentioned above, and noted these statements. I did not suppose for a moment that anyone, in doing such work as this, would accept another's statement of specific gravities for the metals he himself had in hand, but would determine these points for himself, being especially careful that the metals were as nearly in the condition the alloy would be—that is, in ingots he himself had cast—for the comparison with the alloy in the ingot. You certainly know that different authors have varied in the figures they have given for the specific gravities of the metals. Also you certainly know that these specific gravities actually differ, as the condition of the metal weighed differs, often quite sufficiently to give variations of statement as great as the differences you make in my figures by this exchange.

On the other hand, you had the option of saying: Black has noticed that there was a condensation of the metals in the formation of silver-tin alloys, but in his experiments failed to establish its amount (COSMOS 1896, pp. 979–981)—which

would have represented the exact facts—or of using other phraseology of similar purport. Such a course would certainly have served your purpose quite as well, would have been beyond criticism, and would have served the purpose of the development of science very much better.

It is not a question here as to how much melting, alloying, and weighing you may have done, or of the accuracy of your results. The important fact is that in contradicting me, as you say in your open letter, you did not use this means, as is prominently shown on pages 1 and 2 of the January 1909 Cosmos. What you may have shown later in this same paper of alloying and weighing is not of importance in this discussion.

Now, my dear doctor, I hope you will see that what I have written here has been made necessary by the attitude you have assumed in this matter. I have taken pains to explain for you the facts, as I view them, in considerable detail, at the risk of rendering this letter, by reason of its length, dull matter for the readers of the Dental Cosmos. My impulse has been that of the most sincere friendship for you as a co-worker in the development of a very difficult subject. I have the hope that you will receive it in the spirit intended, and go on with this work with increased zeal and care, both as to your observation of results of experimental work and your expressions regarding others with whom you may differ. Remember that differences of view are necessary to the development of the facts in any field of science. Neither should one be too quick in finding fault with methods of expression by others. While it is well to hold closely to the technical language of the science in hand during its more strict consideration, the vernacular expressions of one's tongue are often more effective, especially when calling attention to errors of thought or practice held by many persons. Take for instance the breadth of meaning in a single sentence from Baron Liebig when he said: "Die Seife ist ein Masstab für den Wohlstand und die Cultur der Stätten," which when freely rendered in English means: "The soap used is an index to the well-being and culture of a community." (See "Chemische Briefe," 6th ed., p. 87.)

Now, my dear doctor, I cannot regard these missives as good for me, for you, for our profession, or for the development of science. Therefore let us have done with this kind of letter-writing before the public.

With highest esteem for you and your special field of work, I am,

Yours truly,

G. V. Black.

Chicago, Ill.

THE EDUCATIONAL CAMPAIGN.

To the Editor of the Dental Cosmos:

Sir,—Those who have the temerity to question the advisability of educating the public in dentistry through the press have recently been accused of being jealous and small-minded men and of making hypocritical comments.

The opponents of the so-called "educational campaign" feared that it would lead to newspaper sensationalism. No individual, no community, no profession, no cause has ever been benefited by any kind of sensationalism—but the contrary is true. No one dared even to think that the very first attempt to reach the public through the press would bear undeniable marks of sensationalism, and hence such detrimental evidence against the desirability of the proposed "educational campaign." Almost every paragraph of the articles published recently in Hearst's New York *American* shows the positive stamp of sensationalism. Is the life of the dental profession at such a low ebb

that it must seek rejuvenation by the injection of this kind of literature? Is the education of the patient public to be accomplished by incorrect, exaggerated, and portentous advertisements? To recommend and defend this sort of an educational scheme requires cunning and artifice.

It has been stated elsewhere that ninety-two per cent. of the population of this country neglect the care of the teeth because of ignorance of the possibilities of dentistry. The correctness of the percentage is questionable, and most probably originated in the fertile brain of some shrewd advertiser. A large number of intelligent and prosperous individuals must be found among ninety-two per cent. of this enlightened nation. Upon these, sensational newspaper articles make no serious and lasting impression. The remainder of the ninety-two per cent. are so unfortunately equipped mentally or financially, or both, that a dental educational campaign is misapplied energy, no matter how honestly conducted. Their teeth could only be cared for at the expense of some charitably inclined community or individual, and oftentimes only then as the result of forceful compulsion.

The benevolent men who for various reasons are encouraging this propaganda presume that all legalized practitioners of dentistry not only possess minimum technical qualifications, but also have sufficient personality and management to obtain and hold a practice. This presumption is the weakest link in their chain of reasoning. A school may equip a student with minimum technical skill, but it cannot teach him personality. Dentistry has been uplifted and must continue to be further elevated by honest dentists and dentistry, and not by sensational literature.

RICHARD SUMMA.

ST. LOUIS, MO.

PROCEEDINGS OF SOCIETIES.

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK.

Monthly Meeting, October 1909.

A REGULAR meeting of the First District Dental Society of the State of New York was held on Tuesday evening, October 12, 1909, at the Academy of Medicine, 17 West 43d st., New York city.

The vice-president, Dr. B. C. Nash, occupied the chair, and called the meeting to order.

The Secretary read the minutes of the last meeting. Dr. Walker moved that the minutes be approved as read. The motion was carried.

Dr. Walker announced the serious illness of Dr. Taylor, president of the society, who was on his way to California to recuperate.

Dr. Walker moved that a committee of three be appointed to formulate resolutions on the death of Dr. Joseph Wassall of Chicago. The motion was carried.

The chairman appointed as such committee, Dr. S. G. Perry, Dr. W. D. Tracy, and Dr. W. W. Walker.

The paper of the evening, entitled "Ethics," was then read by Dr. S. G. PERRY.

[This paper is printed at page 133 of the present issue of the COSMOS.]

Discussion.

Dr. E. T. DARBY. Dr. Perry has treated this subject in such a broad, comprehensive, and catholic spirit that I feel I almost ought to apologize for the manner in which I have treated the discussion of his paper. He wrote me some days ago that he would ask me to speak upon the subject. He afterward sent me a copy of his paper, but I had already prepared what few remarks I have to make. My first thought was to re-write what I intended to say, but it occurred to me that since he has treated the subject in a broad, liberal spirit, it might be well for me to individualize or specialize on the non-ethical attitude of one man to another, and I trust you will not think that I am too personal, or would wish to make statements here that are not to be borne out by your own experience or observation.

Dental ethics, professional ethics, Christian ethics, in the abstract are nothing more nor less than the "golden rule" put into practice:

"Whatever things ye would that men should do unto you, do ye even so unto them." Or as David Harum puts it, "Do unto others as you would that they should do unto you, but do it 'fust'."

Unfortunately, in this world of ours where mind and matter are joined in mysterious wedlock, mankind is selfish. The tendency with most men seems to be to appropriate as many of the good things of earth as possible. If this cannot be done honorably, it is often done without honor.

There are men in the dental profession who would not steal a ham, but would not hesitate to steal the patient of a follow practitioner. Their methods are often adroit, and they may seek to justify their act in various ways, but it is theft just the same. It is not a difficult matter for one, if he adopt adroit methods, to undermine the confidence which a person may repose in his medical or dental attendant. It may be done by insinuations so subtle that no mark is left by the sting. "Damning by faint praise" is a favorable method, and in the following manner: The dentist makes a new acquaintance at the club, at a dinner or at any social function; he meets him in travel or may be quartered with him at a summer hotel. In conversation the new acquaintance mentions the name of his dentist, and asks, "Do you know him?" "Oh yes, quite well, a splendid fellow, but it is quite true that his house had to be mortgaged to pay his bills; or, His patients tell me that he hurts like the devil. Do you find it so?"

Or during your absence from home or an attack of illness, a patient suffers pain and must seek relief at the hands of another dentist. He is relieved of pain and asked to call for subsequent treatment, which may or may not be necessary. These visits are encouraged, and insinuations of one kind or another are made which cause doubt to arise in the mind of your patient as the correctness of the treatment which you had given him, and the newly made acquaintance becomes the patient of the one who has kindly relieved him of temporary pain. Were such a dentist to be criticized for accepting a patient under such conditions, his reply would be, "He was dissatisfied with his former dentist and would not go back to him, and I felt that I was justified in taking him." There are men who seem anxious to gather into their practice just as many rich and influential people as possible. Their methods are not always honorable, but that does not matter if they can only accomplish their object.

The code of ethics to which they have subscribed is a dead letter to them, and they seem to have forgotten that such a code has ever been formulated. I am aware that none of us can claim ownership of our patients. When their bills are paid they are no longer our patients. I am also aware that people take offense at trivial things. They may fancy that they have been hurt unnecessarily, that

they have paid more for the services than they think is just; but it would usually be an easy matter for a fellow dentist to whom they might apply to set them right. Many noble men are doing this, but how frequently a shrug of the shoulders confirms the disaffected patient in his belief that he has been right in his deductions, and he leaves the man who has rendered him valuable and reasonable service, when an honest expression of opinion would have set him right and sent him back to his former dentist. Who of us could not mention scores of instances where our brother dentists have treated us in a most unethical manner? and yet we have been generous enough to overlook it, or ascribe it to misunderstanding on their part, or at least to susceptibilities not keenly alive to ethical behavior.

It is sometimes said of the medical profession that its members stand too much on etiquette. I think it might be said of the dental profession that some of its members, at least, stand too little on etiquette, and for this reason, among others, ethics has not been given the respect which we so much crave.

I trust my impulses are generous enough to overlook in my fellow practitioner these lapses of non-ethical behavior, but it wounds me to know that there are so many men in the profession who seem to feel that dollars are worth more than friends, and that a large and rich *clientèle,* gathered honestly or otherwise, is the one thing above all others to be desired. I say to you members of the First District Dental Society and all others present that I would rather have the respect and esteem of my fellow men than every dollar that has been unethically put into other men's pockets from the dawn of dentistry to the present time.

Dr. E. C. Kirk. If you will pardon a personal allusion, let me say that it has been a fixed habit of my life, for the past year or two, to attend church at least once a year. I have developed this habit because I have found the experience to be uplifting, ethically speaking, morally speaking. It affords me an opportunity annually to sit for an hour or so and take moral account of my own sinfulness and shortcomings, and leaves me the balance of the year to devote the same attention to the sinfulness and shortcomings of my neighbors. On the whole, as I say, the annual experience is an uplifting one, but after listening to the eloquent and learned paper of this evening I feel that I ought to be excused for the next year from making my annual pilgrimage to church.

There are a number of things in the paper of the evening which appeal to me very strongly, particularly its broad, catholic character and its consideration of the basal principles of ethics. I am heartily in accord with every sentiment that has been expressed in the paper. I am particularly in accord with the idea that the *code* of ethics is becoming a dead letter, and I applaud that fact, that condition; I hope it is so. From my point of view—and I think I am justified in my point of view, for I believe I have in support of my position the argument of the essayist—a code of ethics is really the exponent or badge of our lack of ethical development. The principle back of ethical codes was settled something like two thousand years ago. Any code of ethics, as I understand the meaning of that phrase, is a series of statements of a negative character as to the performance of certain prohibited things. The code is an amplification of the command "Thou shalt not." It is a specification of a number of things that are not permitted to be done. If you will examine into the nature of the so-called code of dental ethics that we have all subscribed to, it contains a list of things that we shall not do, which it is not professional to do. Such also was the so-called Mosaic code—the Ten Commandments—a proscriptive list of things that "Thou shalt not" do. Judaism conformed itself to the literalism of the ethical code of Moses for something like twelve hundred years, until in the course of time a certain lawyer versed in the Mosaic code inquired of a reformer of that code—a Man of divine origin—as to what after all was the greatest commandment of the law. He did not begin

his reply by a negative statement, Thou shalt not, but by the enunciation of a new ethical principle that was behind the code, and it began, "Thou shalt love." That was the essence of it. Whom? Two beings. First, the Lord thy God. How? With all thy soul, and with all thy might, and with all thy strength. And the other was, thy neighbor. How? As thyself. "On these two commandments hang all the law and the prophets."

What is the statement that has been made to us this evening but a re-statement, for dentistry, of that same principle—that the golden rule is the only code by which we can be safely governed, the rule that we shall love our neighbor as ourself, and that in all things whatsoever we would that men should do unto us, we should do even so unto them.

As long as we only adhere to a code which is of proscriptive character, we produce the type of man who lives up to the letter of the law and either forgets or ignores the principle back of it. He is perfectly well satisfied, and feels that he has done his whole moral duty, if he has done none of the particular things proscribed by the code. It produces the individual who Jekylls in his family and Hydes down-town, is moral in one relationship and immoral in another, whereas the man guided by the fundamental principle back of the code is a safe member of society.

I do not see anything more than what I have stated, as the essence of Dr. Perry's paper. I feel I should be attempting something beyond my powers, or the powers of any of us, to enlarge beyond the one point he has so strongly emphasized—the importance of being governed by the ethical law behind the code.

I want to thank Dr. Perry for having prepared such a paper. It is of great importance and of great benefit to us all to have our attention called to this matter from time to time, even if only once a year, and I congratulate this society that the presentation of the subject of ethics has been made by a man who has so exemplified the principle of ethics in his own professional relationships for such a long time. He speaks to us as one having the authority of experience, and not as the scribe.

Dr. William Jarvie. It gives me a great deal of pleasure to be in New York and meet with my old professional friends again, and also to hear the presentation of such a paper as we have listened to tonight. I read that paper for the first time on Sunday morning, and after doing so, instead of having any spirit of discussion or antagonism to its sentiment, I was in the condition of the old Egyptian lotus-eater, who was so satisfied and pleased with what he had partaken of that he felt like remaining perfectly quiet and enjoying it. It required quite an effort to gather my thoughts into any shape for discussion, so much so that I deemed it wise to put what I had to say on paper, which has proved to be doubly wise, for I have been in the company of the essayist since six o'clock this evening and from that time until entering this room he has done everything in his power to unfit me for the task he has asked me to undertake.

The essayist tells us, among other definitions, that Webster says, "Ethics is the science of human duty"; that the Century dictionary says, "Ethics is the doctrine of man's duty to himself and others"; that the Roman emperor Marcus Aurelius said regarding ethics: "Whatsoever any man doeth or saith, thou must be good; not for any man's sake, but for thine own nature's sake," while Herbert Spencer says, "The ethical or moral law allows full and free exercise of all the faculties, provided such exercise does not interfere with the same full and free exercise of all the faculties on the part of everyone else." In other words, he would have said that everyone has the right to do as he pleases, *provided* he pleases to do right.

Combining Webster, the Century, and Herbert Spencer we get a good definition of what ethics is, but I like what Marcus Aurelius said two thousand years ago, and it is as true today as it was then, viz, "Whatsoever any man doeth or saith, thou must be good; not for any man's sake, but for thine own na-

ture's sake"; that is, a man impelled by a sense of duty alone, or only in obedience to mandate, or a desire to follow certain restrictive rules, can never be truly ethical, or ethical in the highest sense. The impelling force toward an ethical life must spring from within. It must be part of one's personality.

As has been referred to in the paper, a professional man should be influenced by his ethical inspirations to a greater degree, perhaps, than one engaged in any purely commercial pursuit, where the buying and selling of some commodity is based upon fixed laws and values. The lawyer, the physician, and the dentist serve their clients in a purely personal and confidential relation, and the services rendered are of such a character that frequently it is difficult to place a fair and proper money value upon them. Generally there are certain rules which may fairly determine their proper value, but oftentimes occasions arise when the services rendered are of an unusual character, or the circumstances may be unusual under which ordinary services are rendered. It requires intelligent judgment governed by the highest ethical standards to fix the value of such services, or of services rendered under such circumstances.

Unfortunately, all professional men are not imbued with the high ethical standard which the essayist has depicted, and which is our ideal. As the essayist says, "Some live ethically as easily as a sparkling trout-brook runs down-hill." Such men do not need a formulated code to live up to or regulate their lives by, but unfortunately, in the ministry, in law, in medicine, and even in dentistry, men are to be found whose natural characteristics, tendencies, and actions lead one to wonder whether they are not actuated by that parody upon the golden rule: "Do others as others would do you, and do the other man first."

If we would be strictly ethical, we must be thoroughly charitable, and remember that the class of men first mentioned finds it as easy to live ethically as the sparkling trout-brook to run down-hill, while the class of men mentioned later may have inherited tendencies the overcoming of which is well-nigh impossible. Let me illustrate with a story:

Some years ago I met a gentleman, very intelligent, in fact brilliant, but continually in scrapes, a harum-scarum sort of fellow, who was a continual source of worry to his family and friends. He had a brother just the reverse of himself, a fine, level-headed fellow of high standing in the community, who was regarded with great respect by everybody. This man said to me once that he was tired of having people say to him, "'what a fine man your brother George is!' Of course, my brother George is a fine fellow; there is not a finer fellow existing, but he does not deserve any credit for it—he was born that way. He never had the least temptation to be otherwise. Bad as I am, I deserve infinitely more credit for being no worse than I am, than he does for being as good as he is." We must not forget temperaments such as these in judging other people.

We must recognize this fact, however unpleasant it may be, that there are some men in the dental profession who, whatever the influencing cause may be, will conduct themselves so as to bring reproach upon their fellow dentists and discredit the profession. For such, difficult and delicate a task as it may be, ethical standards should be tabulated or codified, and a strict adherence to these should be required of all members of dental associations, so that they and the public may understand that the dental profession discountenances and will not tolerate among its associates methods and practices which are unethical and discreditable. Such a code would be necessary in case charges were brought against a member for unethical conduct, since, if there is no law, there can be no punishment for the infraction of what does not exist.

In this great city almost every race of the world is represented. There are members of many nationalities practicing dentistry, some of them with not very high ethical ideas. The profession is made up of units of which each member is one, and the ethics, or lack of ethics,

of each has an influence upon the estimation in which the whole profession is held by the community. A code of ethics would be a means of enlightenment to some such practitioners, and possibly a step in the way of educating others as to what is required of them.

The essayist has ably and feelingly spoken regarding the duty of dentists toward each other, and I would like to second every word he has said. If all the members of our profession were imbued with as high a standard of ethics as the essayist himself, it would be unnecessary to say a word upon this point. Unfortunately it is not so; but if it were, there would never be but the utmost faith and confidence in each other. No tales told by a patient derogatory of the manner or services of a brother dentist would be given credence. No shrugs of the shoulder or inflexion of voice indicating disapproval would occur while one dentist was talking of another to a patient. No patient sent to another dentist for temporary treatment would ever be retained. The most charitable estimate would ever be put upon another dentist's work, even if it perhaps did not appear quite as creditable as one's own. Not knowing the condition under which work was done, efforts would always be made to throw a mantle of charity over the apparent failures or even mishaps of others. If we had faith and confidence in each other, and if we really had this high ethical standard, peace and perfect harmony would reign throughout the membership of the dental profession.

The essayist has spoken of the lack of loyalty and sense of obligation that is sometimes exhibited by patients toward their dentists. During my career I have known of persons changing their dentists with the same indifference with which they would change the place where they had been in the habit of purchasing their hats, and this in cases where the dentist had exercised his very best ability in caring for the patient, not at all for the money return which he might receive, but from pure interest in the individual and his or her dental welfare. Thank God such cases are comparatively few, but they do happen, and I do not see how we can prevent their occurrence. In contradistinction to this class of patients, however, I want to record from my own experience the very large number of patients who have been most loyal, sometimes under disheartening circumstances, when severe pain has been suffered owing to acute inflammation, alveolar abscess, or discomfort caused by artificial dentures, etc., and when treatment has seemed for a time a failure—yet in spite of all this, and in the face of advice from their family and friends to try *their* dentist, a loyalty and confidence has been exhibited to make one feel glad to live and to know such people. Some of my dearest and I trust most lasting friendships have commenced at the operating chair, and I am glad that I have practiced dentistry if for no other reason than for the many happy associations which have come into my life through it.

In conclusion, I wish to speak of the duty which the dentist owes to his patient. As has been said, the relation between dentist and patient is of an intimate, confidential, and in many cases of an almost sacred character. The mother intrusts her daughter, the brother his sister, or the husband his wife, not only to your professional care, but to your honorable conduct. Every dentist should accept such a charge as a sacred trust and keep it inviolate. His first duty should be that to his patients, and the welfare of the oral cavity. The patients are generally ignorant as to what is needed, and they trust in the dentist's judgment and skill. In considering a course of treatment, the patients' age, temperament, the amount of time at their disposal, and their means should be taken into consideration in deciding what is to be done to make the teeth as useful and as ornamental as is possible, and for as long a time as possible. In passing, let me say that I know that this procedure is against the teaching of some who urge either the ideal treatment of every case or none at all, which course in very many cases, if persisted in, would result in nothing being done and the patient being left uncared-for.

After deciding upon the course of treatment, operate with your greatest skill and thoroughness, in your most gentle and tactful manner, and with the utmost consideration for the comfort of your patient. Charge what you deem a fair sum for your services, and at the end of the treatment feel in your innermost soul that you have done by your patient just as you would have your wife, sister, or daughter done by. Do all this and you will exemplify the highest standard of ethics.

Dr. CHARLES S. STOCKTON, Newark, N. J. I have listened with the greatest pleasure to this splendid paper, and my sincere regret is that the manuscript itself did not come into my hands sooner, it having reached me only late today, and I have not had time even to read it carefully. Consequently, what I now have to say is based on a very hurried reading of its headlines.

Some men write beautifully on any subject. Our editorial writers on the great daily papers write the policy of the paper which they are hired to serve, while their own views are quite of a different character. Our essayist has the happy faculty of saying what he thinks.

The reason why he has so many friends is that he treats his friends with the same conscientious consideration as the believer watches over the dignity of his God.

The paper covers the subject so fully and so well that there is hardly need of referring to any particular part of it. As the essayist well expresses it, we cannot help an inspiration to greater things in our own profession when we behold the marvelous things that have taken place and are daily taking place about us.

All the wonderful things that the essayist has cataloged should indeed inspire us to greater and better work in our chosen calling. I think that the world is growing better, that many of our fellow practitioners are becoming our best friends, and this is because we in a measure, at all events, do unto them as we would have them do unto us. If this blessed rule is practiced and made a very part of our being, the code of ethics will no more be printed with the constitution and by-laws.

And then, "If you have had a kindness shown you, pass it on."

The world can never know thee as thou art,
Much less with truth can judge thee as it ought;
But, if thou hast with courage done thy part,
For thee there's nothing further to be sought.

Our profession is growing more and more into specialties, but when the family dentist has the faculty and the ability, he should turn no patient over to another practitioner.

The relationship of dentist and patient should be such that they count each other as their dearest friends. But when cases are such that the dentist is satisfied that the patients' welfare would be best served, there should be no hesitation in placing them in the hands of one who we know can accomplish the work better than oneself. It is a pleasure, as Dr. Perry has said, to do little acts of kindness for the patients of another practitioner, and I have never made a charge for any such work.

Long ago I have ceased to ask a new patient who his dentist had been, for I found, as Dr. Perry has stated, that he resented it.

Patients come and patients go, and we wonder why, and they do not care to tell.

I have made it a rule—and it goes a little farther than the one which the essayist has given us—no matter how poorly the work may have been done, to say nothing about it; for sometimes it somehow gets back to the dentist, and he does not love you any the more for it.

A patient of mine had some of her teeth filled temporarily with gutta-percha; they were very sensitive, and she was to return in a few months and have permanent fillings inserted. She happened to visit another dentist in company with a friend, and was induced to make an appointment, and the dentist took out the temporary fillings, and put in the permanent ones. The pulp died in one of the teeth, and the pain brought

her back to her old dentist. That dentist needs a dose of ethics.

It was once said to me by a dear brother, "A man who will steal your patients would steal your pocketbook if he had a chance."

Before that incident I had a high appreciation of my *confrère,* but—

The sweetest dreams we ever dream
Are but the shadows of the night;
The brightest hopes that ever beam
Are shadows which delude our sight.

Our lives do become monotonous, as they generally consist in doing the same things over and over again, a round of perpetual routine. There are times, however, when the clock of life comes to one of the striking hours, and the hopes, the joys, the aspirations come out. Let this evening be one of them, and Dr. Perry's ringing words be the power that shall lead us to higher living and better thinking concerning our beloved calling.

Only one thing more: Value your services so highly that your patients will do the same—they will soon come to value them at the same price as you put upon them; and ever strive to do the best you can for the patients, and then—

Still seeking what you sought when but a boy—
New friendships, high adventure, and a crown,
You shall grow old, but never lose life's zest,
Because your life's last work will be the best.

Happiness is the aim, the object of life's struggles. It is a condition of feeling, not a condition of circumstances, and to common minds one of the first essentials is the exclusion of painful and harassing doubt. We want the love and respect of our fellow practitioners, and nothing is more conducive to our happiness than this, excepting only our own immediate family surroundings. Therefore to this end let us all try faithfully to carry out in everyday life the rules so forcibly laid down by the essayist.

We want, in fact we must have, belief in our fellow man, for on this belief the whole structure, foundation, and superstructure of our lives is based. It behooves us, then, to so shape and form our lives that all the world may take notice and find us not wanting in any of the true characteristics that mark a *man.* Above all, see to it that when the day is over and you review its work, it commands your own respect.

We yearn for recognition and remembrance. The hardest thought concerning life is that we drop out from among our fellows, the water closes over our heads, and it is as though we had never been born. Let us then, while we live, try to have not only self-respect, but the love and confidence of all our fellow practitioners.

Dr. R. Ottolengui. I read Dr. Perry's paper today with a great deal of pleasure and profit. It is filled with beautiful epigrams, which I find were not as discernible on hearing the paper as when I read it.

When I returned the paper to Dr. Perry by a messenger, I sent a message which I hope he received. I said, "Please tell Dr. Perry that his paper is a poem." I need make no further comment on it. His position is absolutely sound in every respect.

There was one particular paragraph that struck me forcibly, because just exactly that view of it had never entered my mind before, and I want to relate a little incident that occurred in my office today. Dr. Perry said that he has finally concluded that to ask patients who their previous attendant has been might be considered as "bad manners." I had never thought of it in just that light, but I began discussing the matter with the next patient who came to the chair after I read the essayist's paper, and though I had not told the patient what Dr. Perry had said, she related the following:

"Only two nights ago I was with some company, and one woman declared that she had just been obliged to make a change of dentists, and had gone to a certain gentleman, whom she named. One of the other ladies said, 'Did he ask you who had been your previous den-

tist?' and another lady present said, 'Why, no—he would not have such bad manners,' and the lady herself said, 'Why, certainly not; he had more tact.'"

I just relate that to show that patients agree entirely with Dr. Perry's view that it is not necessary to be too inquisitive as to why they changed their dentists. One epigram which the essayist made was, that by adopting this rule of non-inquisitiveness he is saved from doing injustice to his friends or justice to his enemies.

After this comment on the paper, I am going to take the opportunity of this occasion, while the air is filled with an ethical atmosphere, to address you on a phase of this subject which the essayist has overlooked, and which at the present time is being much discussed by men who claim to be ethical. It is the one subject that has been brought up to me this summer wherever I met a dentist. I allude to the question of the relation of those members of the dental profession who take out patents.

Dr. Kirk has justly spoken against codified ethics, and much more might be said. About 1892 I wrote a paper on Ethics,* in which I antagonized codified ethics. Subsequently Professor G. S. Dean of California wrote a classic on the subject of Ethics, which you will find in the July 1893 DENTAL COSMOS; it was inspired by and was a reply to my article. I commend the reading of that paper to you, especially because of the time at which it was written. It is not only a classic and almost final in its statement of ethics and ethical relations, but it was a wonderfully fine example of ethical discussion of another man's views to which one wishes to take exception. I mean that, while entirely disputing my position, his whole attitude was so perfect as to be an example of ethical discussion in dental literature, which I regret to say has not always been followed by those who came after. No paper has been written on the subject since, as far as I have been able to find; it is therefore sixteen years since a paper of such length and importance has been devoted to this subject.

Ethics in principle today is, as it always has been, unchangeable, but in its application it must ever change with the progress of times. Let me give you a good illustration of what I mean by the necessary change which the ethical attitude of persons undergoes in the current of events.

The first roads that man crossed were undoubtedly trails through the forest, and one man had the same right as another. When those broadened into paths, and the foot passenger began to ride horseback, the equities changed, and the question arose as to whether the man on foot had more or less right than the man on horse. The same with the waterways. With the increase of navigation it became necessary to make definite rules of the road in order to protect the various rights of individuals. So in our roads today we have the automobile, and with it the necessity of changing the codified law to keep pace with the times; and while the foot passenger has as much right as ever, the man who likes to go in his automobile has as much right as the man on foot.

Our so-called professional ethics are weak if we do not make them keep pace with progress. Unfortunately there is a class of men in our midst who pose as being the special exponents and disciples of ethics, yet these men are themselves unethical because of their conscientious but mistaken reverence for rule. They have their written code, and it was written so long ago that they consider it a sacrilege to change it; any man who goes contrary to that code is unethical in the minds of these men. Consequently these men are themselves unethical—because they are intolerant, and intolerance is not Christian, and anything unchristian is not ethical.

It has been said that a man who takes a patent is not ethical, that he is guilty of a breach of the code of ethics. If this means the written code of ethics, I defy you to show it to me in print. If it means the unwritten law, I say it

* See COSMOS for May 1892, vol. xxxiv, page 366.

is time that such a law were written, because the unwritten law may be expounded in accordance with each man's notions, and to that extent we need a code—not so much as to how a man shall conduct himself, but as a restraining influence for those who would punish a man who goes counter to their private views.

It has been said that I have been inconsistent in regard to this matter of patents. Dr. Kemple sometimes quotes to me the following passage from Emerson:

> A foolish consistency is the hobgoblin of little minds, adored by little statesmen and philosophers and divines. With consistency a great soul has simply nothing to do. He may as well concern himself with his shadow on the wall. Out upon your guarded lips! Sew them up with packthread, do! Else, *if you would be a man, speak what you think today in words as hard as cannon-balls, and tomorrow speak what tomorrow thinks in hard words again, though it contradict everything you said today.* Ah, then, exclaim the aged ladies, you shall be sure to be misunderstood! Misunderstood! It is a right fool's word. Is it so bad to be misunderstood? Pythagoras was misunderstood, and Socrates, and Jesus, and Luther, and Copernicus, and Galileo, and Newton, and every pure and wise spirit that ever took flesh. To be great is to be misunderstood.

I am appealing to you all for a little ethical indulgence toward me tonight in this matter of my relation to the question of patents, and I ask you to permit me to give you my version of my own position. It is a well-known fact that I have antagonized so-called process patents, but I do not think my position in this matter has ever been really understood. A very prominent visitor to our society last year said in this room, "If a man takes out a process patent, he is guilty of a breach of the code of ethics." I said nothing at that time, but I took that man out to supper, and before he went to bed I made him take that back, and I give you the argument now: "Is it unethical to take out a process patent?" I say No, because in the days when we were all suffering from the misuse of process patents by the Crown Company, a very prominent member of our Odontological Society invented a method of crowning teeth, and took a patent on that process for the protection of the dental profession, in order that no Crown Company agent could ever mulct the dental practitioner who might desire to crown teeth in that way. So it is not the taking out of a process patent that is unethical, but it is the use which you may make of it after you have it which may be unethical.

You know without mentioning names that I am talking of William H. Taggart, a man who received in this very room the tumultuous applause of one of the largest audiences that ever gathered here. This man, it seems to me, has been found guilty upon no evidence except that he has been accused of intending to do a certain thing. We have been told that if he can establish his process patent, then he will do certain things with it; and I maintain that that itself is not ethical conduct on the part of the dental profession, to condemn a man because he is accused of intending to do something. Up to date he has not done these things, and it would be Christian behavior on our part if we would wait until he does make a breach.

I would cite a remark that Professor Dean made in 1893, long before this question in its present form came up, and I tell it to you with more sincerity because I met with these arguments before the committee in Washington, when I endeavored to have a law passed to prevent the granting of process patents. The Commissioner of Patents came before the congressional committee, and we had a two hours' discussion in regard to this matter. He contended that the dental profession has no more right to expect exemption from the patent laws than has anyone else. He contended that a patent is not granted for the advantage of the inventor at all, but for the community. It is the wisest and only method which governments have discovered thus far to inspire men to apply their faculties and to work out things which shall be of advantage to the community, and in order

that the community may eventually have full use of these inventions his protection is limited to a term of years. That is done in order that the inventor may find a reward for his work, and that principle is just as sensible when applied to the dental profession as to any other.

Professor Deane says that professional ethics is merely class ethics, and when it goes counter to general ethics it is illogical and wrong, and if the dental profession desires to deprive one of its members of the right of taking a patent, then it must do for that man one of these two things—it must either do for him what the government does for him, viz, provide his reward, or else it must buy from him his invention for the benefit of the rest of the craft; and this is not in the interest of the inventor, but in the interest of the profession at large.

I believe that while the dental profession as a body has been dealing unjustly with Dr. Taggart, they have not, as individuals, been unethical, because the idea that it is wrong to take out and hold patents has been a part of their training, which has been wrong training. Every progress and advance in the profession today is largely dependent on men like the essayist of tonight, who has had the courage to protect his inventions by patents in order that they may be given to the profession in their best form. I have not taken out patents, but I once invented certain instruments and gave them to the profession; they are not now given to the profession in their best form, for the very reason that all manufacturers are free to make them, and it is cheaper to supply them to the profession as they are made today than in the form which I designed.

I have wandered a little, but I wanted to point out to you that there exists a question of ethics in the profession today in relation to patents which is an unwritten law, and I think it is high time that the question should be thoroughly studied out, and a law formulated and written, so that the men who honestly invent contrivances for us may know in advance how they will be treated by an ethical profession.

Dr. W. W. Walker. There is probably not one dentist out of a hundred who intentionally in any way violates the code of ethics. You know what Dr. Holly Smith said about the Virginian who violated the code. He went and apologized to the man for hitting him on the head with his club, because he did not have his revolver with him. We all do things of that kind some time, and afterward are sorry for it.

Dr. Perry spoke about the congenitally unethical man. There is one of that kind in every hundred. Congenital deformity is the most difficult to correct. Look out for the man who goes to church twice every Sabbath, says grace at the table, goes to prayer-meeting, talks to all the young men in a fatherly way, and then is caught coming out of a low gin-mill. That is the man who has the dagger up his sleeve ready to stab some man in the back. Ninety-nine men out of a hundred will not do anything bad, but it is the one bad man of whom you want to beware.

Dr. G. A. Mills. Dr. St. John Roosa, whose picture hangs in this room, made a statement in the New York State Society in regard to the code of ethics, that no gentleman needed a code of ethics, and he fought that battle against Dr. Austin Flint, Jr., and won his spurs.

I may say that I am the oldest practitioner here, having been in practice fifty-nine years. I have seen a great deal of dentists, ethical and unethical, and I have seen a good deal of myself, and at my age I have come to the conclusion that there is "no good in me." I must have a Substitute for my moral and righteous character.

I attended the banquet given to our dear friend, Dr. Darby. Before going there, I read in the paper a statement made by King James many years ago. He said, "I can make a lord, but only God Almighty can make a gentleman." I went to Dr. Darby and said that I wanted to apply it to him.

Dr. Kirk focalized some excellent truths—viz, Is it outside or inside ethics that you want?—and Dr. Perry quoted the Sermon on the Mount. The Man

who gave that sermon can stand for ethics!

We can talk of the Sermon on the Mount, but there is not a man living who can keep its teachings; but provision has been made by which man can live a truly ethical life, and that is through a substitute, which is Jesus Christ.

Dr. J. Grant Pease. I agree with the discussion in regard to the letter of ethics. We have to live by the spirit of ethics, by knowing what is just to our fellow man.

The essayist spoke of the value of services rendered, and of knowing what that value is. Every man should know his own value and the value of the services which his patient is receiving at his hands, and he should unhesitatingly state that value as a just demand.

The value of all professions is gaged by the services that the patient or client receives from the dentist, or the physician, or the lawyer.

We should all be kind and considerate to all our professional brethren. Sometimes patients come to me who apparently have had work done by others in a way in which it should not have been done, but I always try to take a charitable standpoint, as I cannot always know the exact conditions under which that particular operation has been performed.

Dr. Perry. I have no remarks to make in conclusion, except to voice my appreciation of Dr. Jarvie's kindness in coming so far from his summer home to discuss this paper, also to thank Drs. Darby, Kirk, Stockton, and Ottolengui for their willingness to discuss a paper which they have had so little time to read. I appreciate very fully the very kind manner in which my paper has been received.

Adjournment.

Herbert L. Wheeler, *Sec'y.*

PENNSYLVANIA STATE DENTAL SOCIETY.

Forty-first Annual Meeting.

(Continued from vol. li, page 1426.)

Wednesday—*Morning Session.*

The meeting was called to order on Wednesday morning, June 30th, at 10.30 o'clock, by the president, Dr. Bratt.

The first order of business was a paper by Dr. W. G. Ebersole, Cleveland, Ohio, entitled "The Application of Successful Business Principles in Dental Practice."

[This paper is printed in full at page 181 of the present issue of the Cosmos.]

Discussion.

Dr. W. W. Booth, Carnegie, Pa. In presenting with such force and eloquence a subject such as this, Dr. Ebersole has opened the eyes of many of us to a panorama of serious truths which make undoubtedly a terrible arraignment of our business methods. To have such an eminent man as Dr. Louis Jack say to us, "All, with one exception, have died poor," is enough to make us stop and ponder.

I am very glad that our committee has seen fit to have a paper read upon this subject, and I am sure that their choice of Dr. Ebersole for this duty could not have been better. There is enough in his essay for discussion to fill nearly all the time of the forty-first annual meeting of this society. The essayist deals with us firmly, but gently. Our offices, our equipment, our appearance, and our actions are gone over critically and fear-

lessly, but kindly. "Look well to the little things. It is the thousand nameless little things, which nobody can describe but which everybody feels, which conspire to form that whole of pleasure, just as the several pieces of mosaic work, though separately of little beauty or value, when properly joined form those beautiful figures which please everybody."

I am sure that were a certain time of every meeting of every society set aside for a little talk on "The Application of Successful Business Methods in Dental Practice," it would not be many years before the saying of Dr. Jack would be relegated to the archives of the past.

The young man in college receives but little instruction in the business principles of a successful practice. As far as the word success is applied to the possession of a large practice, acquired by gentlemanliness in the full sense of the word, by a thoroughly clean and up-to-date equipped office and by good workmanship, I honestly believe that there is no reputable school in the country where the professors and assistants do not strive with all conscientiousness to bring every young man up to this standard. If, after three years of association with such men of high ideals, the graduate starts with a slovenly office and slovenly ways, content with a transient practice and not striving for that enviable position of family dentist—which, by the way, means a great deal—I say, if after three years of good training he starts in this way, it is not the fault of the college. The man himself is at fault; but perhaps after some years, by close contact with other men, and no doubt by listening to such papers as the one read today, he will be born again.

So much as a good word for the college endowment of good character and of proficiency in operative work. But what of the financial side of a successful practice? It is a grave error on the part of the schools to send a man out without one iota of knowledge how to charge for his services, how to keep his records systematically, or without any idea pertaining to the money end of our vocation. This is a serious error, and I trust that such men as Dr. G. W. Clapp, editor of the *Dental Digest*, whom the essayist has lauded most justly, and Dr. Ebersole, will continue to emphasize this subject until our schools wake up to its importance.

This paper is going to do a great many of us a great deal of good, and I hope that when it is published, the thousands who will read it will thank Dr. Ebersole, as we do, for taking the young man by the hand as he steps out of college, and conducting him through a successful and honorable practice.

Dr. W. L. Fickes, Pittsburg. The dentist should have a definite system upon which to base his fees. Neither the piece system nor the charge for time only is always just or profitable. A system based upon both of these methods seems to me to be the most equitable that can be devised.

We will suppose that a man calculates when beginning practice that it will be necessary for him to make one thousand dollars per year to cover his expenses, and that he wants one thousand dollars for his net income. His expense could be provided for by a charge for each working hour sufficient to amount to one thousand dollars per year, and his income could be provided for by a special fee for each operation, based upon the importance of the operation to the patient, and the knowledge, skill, energy, and material required, the total to amount to one thousand dollars.

He could estimate the number of hours a year which he would probably work, allowing liberally for holidays, Sundays, vacations, sickness, and lost time. One thousand dollars divided by the number of hours would give the proper charge per hour for expenses. A scale of charges for operations could be arranged according to their importance so as to average one thousand dollars for income. By this plan a man could increase the charge per hour to cover increased expenses, or he could raise his own salary when he felt it necessary or possible, by increasing the special fees for certain classes of operations.

Dr. W. H. Fundenberg, Pittsburg. I cannot allow this opportunity to pass without saying that I have been delighted with this paper. It ought to be very valuable to the young men beginning practice. They cannot be trained along these lines in the colleges; all that the colleges can do is to teach them principles, and dentists, even after leaving an institution, will be like business men, some will succeed and some will fail. The essayist has given us ideas from which I hope we may benefit.

The question of fees is one that will be determined very much by the community in which we live. If Dr. Ebersole lived in Pittsburg he would probably be obliged to charge one-third more than he would in Cleveland, as this is one of the most expensive cities of the country, and necessarily the dentist has to adjust his fees accordingly.

The essayist has not mentioned in his paper one point which I think is important, and on which I would like to hear his opinion; that is the question of rest and recreation and the hours in which the dentist should work. No one can go beyond a certain number of hours a day, after he has practiced for a number of years. I should also like the essayist to give us his opinion as to continuous dental work, including Sundays. We have some men who work seven days in the week, and some claim that they cannot make a living without doing so. I think that the man who confines himself to six days' work in the week and knows just how many hours he is able to work will be prepared to do more in the long run, and will probably live longer.

Dr. G. W. Clapp, New York. The subject which Dr. Ebersole has brought before the society is very important for the profession at large. Different men in dentistry strive to benefit their profession in different ways. No one here has more admiration for the professional side of practice than I, and I am glad for each advance whereby our service to the community is bettered. I cannot help feeling that the arrangements of service and reward are not quite equitable, that we are not receiving adequate returns for our labors. Dr. Jack's intimation as to the business methods of the profession impressed me all the more forcibly because I am in a peculiarly favorable position to know how far it is true. There are men in every community having not only professional but financial success, and enjoying the pleasures and comforts of life. Other men in the profession in nearly every community are having professional success, but are not succeeding financially. Within the last year I have had the sorrow of meeting a number of professional men who are reaching that stage of life when physical infirmity prevents them from meeting any longer the demands of strenuous practice. Before them lie the years of old age and lowered physical capacity, with no financial resources to sustain them during that time.

I wish that each of us might realize that the profession has two sides, not only the rendering of service to our patients, but also the earning of a competence for ourselves and those dependent upon us, by which we may store such resources as will tide us over the years of old age. It seems a discredit to the profession that dentists spend their energies in the exercise of their profession during the prime of life, and yet, as the example of so many illustrious men in the profession shows, reach the years of age and infirmity, when life should be full of pleasure and riches, without the means of maintenance.

Many men in the profession are performing operations of which they do not know the cost to themselves. I am not detracting in the least from the high professional character of any operation when I say that the dentist should know the cost of every operation that he performs. Any successful business man first computes the cost of an article that he is about to offer for sale.

If you insert a filling, an inlay, a bridge, or do prophylactic work for less than cost, you may be doing your patient the highest form of professional service, but you are doing yourself a manifest injustice. The custom of putting in amalgam fillings at the prices now current in

many communities is not good business from the dentist's standpoint, for this reason: Some fillings can be put in at a dollar with a profit, but if you take into consideration all the elements of actual cost, you will find that the time consumed in properly cleaning the cavity with due respect to the patient's feelings, in preparing it in such a way that the filling will resist the stress of mastication for a reasonable period of time, in properly putting in the filling, polishing it properly, etc., is such as to make that amalgam filling a financial loss to the man who puts it in for a dollar. I hope that the day may soon come when we shall know the cost of our operations, and that when doing high-grade work we may be able to do it with a profit.

Dr. Ebersole (closing the discussion). I regret very much that we are not able to continue the discussion, because in preparing this paper I was above all looking forward to a full and free discussion of my ideas, which were expressed with a view to learning from you that which would benefit me in making a success of my own work. In my life and my dental practice I have reaped the greatest benefit from what we are sometimes pleased to term "knocks." No man is broad enough to see all things, and some of the best ideas are gained from the criticisms of fellow men.

I am now going to answer a few questions that were asked in regard to the paper. One might gather from the questions asked that my idea is chiefly the dollar, and one gentleman has said that it should be; but, gentlemen, I say, No! The first thought is the patient. Remember—*The first thought is the patient;* the operation is second, and the dollar is last. We should think of these three together, and I do not want any man to misunderstand the paper. I am speaking upon the last and least of these three great considerations, the patient, the work, and the dollar, the last of which is of sufficient importance to be taken up by organizations of this kind. My paper was written with the sole object of lifting the dental profession to its proper rank. You cannot command the respect that you should receive in your communities if you are obliged to dodge bills. One of the ablest and most meritorious men whom I know in the profession is today unable to meet his current bills. What kind of position has such a man in a community! He cannot command the proper remuneration for his services. If dentistry is ever to stand where it belongs, it must go beyond simply considering the patient and the operation, and must take into consideration the three questions. The community will respect us when we can command consideration of the theories that we wish to advance and when the methods that we advocate and the work that we do can be shown to bring in the dollars and cents.

A remark has been made on the working power of the man after he leaves school, and in answer to that I have to say that I did not read some portions of the paper pertaining to that, which will, however, be published with the paper.

The next question was that of rest and recreation. In my paper I say that a young man in starting may reserve two weeks for vacation, also the Sundays, and he will have three hundred working days of eight hours a day, which will make twenty-four hundred hours of work during the year. I say in parenthesis that the young man who is not busy does not need to consider the two weeks' vacation during the first year, as he will have enough vacation without the extra two weeks. It is also not necessary to limit a man to eight hours. I work more than that almost every day. In order to get started it may be necessary for a young man to work on Sundays, and he surely must work for all who come. As to working on Sundays, I believe that if a man has plenty of work to do in six days of the week, he deserves to fail if he works on Sundays; for he lowers himself in the community. I have gone through all that experience with patients who say that they can come for treatment only on Sunday. When a man cannot come at any other time for dental work, he does not value your services sufficiently to pay you an appropriate fee. The man,

therefore, who is busy for six days in the week can afford to let the young man who is trying to get a start in dentistry have the patient who cannot come during the six days.

The next order of business was the election of officers for the ensuing year. Dr. Weaver, secretary, presented the report of nominations for officers from the Executive Council, and the society proceeded to the election of officers, which resulted as follows:

President—W. D. De Long, Reading.
First Vice-president—C. C. Walker, Williamsport.
Second Vice-president—W. H. Fundenberg, Pittsburg.
Recording Secretary—L. M. Weaver, Philadelphia.
Corresponding Secretary—J. H. Crawford, Pittsburg.
Treasurer—W. A. Spencer, Carbondale.
Executive Council—A. P. Lee, W. L. Fickes, and J. F. Biddle.
Board of Censors—R. J. Seymour, H. M. Sober, R. R. Hutchison, C. V. Mierley, and J. E. Nyce.
Board of Dental Examiners—G. W. Klump, J. D. Whiteman, T. A. Hogan, and A. H. Reynolds.

The meeting then adjourned until 8 P.M.

Evening Session.

The meeting was called to order at 8 o'clock P.M., Wednesday, June 30th, by the president, Dr. Bratt.

The first order of business as announced by the President was the reading of a paper by Dr. H. L. Wheeler, New York, N. Y., entitled "The Treatment of Children's Teeth."

[This paper is printed in full at page 144 of the present issue of the Cosmos.]

Discussion.

Dr. G. W. Klump, Williamsport. We are very much indebted to the essayist for calling our attention to a matter of so much importance, for the preservation of the deciduous teeth in my opinion is of more importance than that of the permanent teeth. If the deciduous teeth are preserved in good condition until the permanent ones appear, there is no reason why the latter should not be preserved during life. We ourselves do not as fully appreciate the importance of this subject as we should. It is not always very pleasant to work for children, or at least for some children. Some of them are very timid, and you are hardly able to approach them in any way. If you succeed, however, in gaining and retaining the confidence of the little patient in treating the deciduous teeth, the preservation of the permanent set is practically assured.

I am glad that the essayist called our attention to the various ways of preserving these teeth. While I am not a chemist, I am somewhat in doubt about the combination of zinc oxid and oil of cloves. Such a combination would no doubt be soothing and to some extent germicidal, and therefore very acceptable, but I presume that it would be necessary to cover such a compound with something more permanent. Gutta-percha makes a good filling in any tooth that is not too much exposed to abrasion. I have seen gutta-percha fillings in approximal cavities that have lasted for years, and in many places I think gutta-percha makes not only a good temporary but an excellent permanent filling. Of recent years I have preferred the copper oxyphosphate for the posterior teeth of children, especially as it seems to be easy to manipulate it and to contour the filling and thus retain the approximal space. You will find less abrasion and breaking down of frail walls of teeth. In deciduous molars I like this cement very much better than any other material. Its ease of manipulation causes much less pain to the patient, and it is probably the most adhesive of cements. The only objection to it is that it is very black, but that does not detract so much from its value in the posterior teeth.

In conclusion, I wish to repeat that I feel that the preservation of children's

teeth is the most important of the dentist's professional duties.

Dr. G. S. Schlegel, Reading. When I received the invitation to discuss this paper, I certainly realized, as I do in my practice daily, the importance of this subject. It is not so important what we do to the teeth as it is to decide by what means we may get our youthful patients to submit to dental operations. This is a very delicate procedure in many cases, when children of no more than two and a half years of age report at our offices needing just as much attention as do the children that come at the age of six years or for treatment of the permanent teeth. When a child is first presented to us it is probably best to do as little as possible; the sittings should be short and frequent, and above everything else no pain should be inflicted. If they complain of toothache, we can usually relieve that by the application of a sedative dressing. We should not scare them with an array of instruments, or find cause to deceive them, but if we deal with them properly and get them into our confidence, I am sure no patients think better of us than those whom we have had in our practice from the ages of three and four years, and who have known us and trusted us.

Much might be said for and against gutta-percha in deciduous teeth, and I would indorse the remarks of the essayist as to its value not only in these, but in permanent teeth as well. I also want to put in a good word for copper oxyphosphate. Many deciduous molars cannot be saved by any other than some plastic filling material, and it is only right, if we want to carry out the ideas of the orthodontist, that all deciduous teeth should remain until the time for the eruption of the permanent teeth. Until that time we should not interfere with anything which nature may want to do. We should make sure that the deciduous teeth are in place when the permanent ones erupt, and copper oxyphosphate is a splendid material for preserving the molars, because it has a germicidal effect upon the tooth structure and can be worked in saliva.

There is one agent that Dr. Wheeler did not mention, with which I have been very successful in treating some deciduous teeth that were badly broken down; that is, silver nitrate. I think nothing could take its place in the preservation of deciduous teeth. I consider it particularly valuable in patients, such as I am sure all of you get, whom we cannot keep in the chair for any considerable period of time, and in whom we can do no more than cauterize, as it were, some of the tissue, the application of silver nitrate causing albuminate of silver to form and preventing caries to a large extent. I want to indorse everything the essayist has said.

Dr. J. F. Biddle, Pittsburg. This subject, the care of children's teeth, I believe to be one of great importance to our profession, and Dr. Wheeler's paper has impressed me greatly.

Before considering the care and treatment of children's teeth, might we not, however, consider our treatment of the child himself? How many of us feel that we are successful in our dealings with children? and what is the cause of our failures? Usually there is an indefinable something in the make-up of the individual, call it personal magnetism, love of children, sympathy, or what you will, that gains the confidence of the child, and if his confidence is once gained and care is taken that it be not violated, the child is practically yours for once and all. Many of us, however, are prone to forget that the children of this generation are the men and women of the next, and that their friendship may count in practice afterward.

Another factor in our success upon the practice of which too much stress cannot be placed is the avoidance of unnecessary pain. This should especially be aimed at in dealing with children. Many people neglect their teeth, not owing to ignorance of their importance for good health, or on account of unwillingness to pay for dental service, but simply owing to their having been subjected to excruciating pain in early childhood. We should make a study of the powers of endurance of our little patients. Remember that all have not the same capacity for bearing pain.

It is the duty of every dentist to inform the parents as to the time of the arrival of the first permanent molars. Since these molars appear behind the deciduous teeth without any deciduous teeth being lost, parents are deceived and suppose these molars to be deciduous. For this reason they are more frequently lost than any of the other teeth.

We surely all agree with Dr. Wheeler that the deciduous teeth are as important in their time and place as the permanent ones, for they are certainly as essential to the child as the permanent ones are to the man. If their retention and filling were more generally advocated, doubtless we would observe less lack of development in the jaws, and I fear the orthodontist would be less busy. Are not we dentists responsible in many cases for the existing conditions because we have failed to advise parents as to the importance and necessity of the preservation of these most useful organs?

I heartily agree with Dr. Wheeler in his advocacy of gutta-percha as a filling material. In the filling of children's teeth I deem it invaluable. It will not only outlast many gold fillings, but, as the essayist has said, all of the oxyphosphate and silicate cements. The idea seems to prevail to a certain extent that it is used largely by those operators who are incapable of properly inserting a gold filling, but those who are familiar with its use know that much skill is required if it is to be properly inserted and finished.

In permanently filling root-canals in deciduous teeth, I have had excellent results with paraffin and oil of cloves, which can be easily and quickly inserted.

I have never used the mixture of amalgam and oxyphosphate described by Dr. Wheeler, but have had satisfactory results by introducing an ordinary oxyphosphate filling into the cavity and pressing a ball of soft amalgam into it, precisely as you would seat an inlay. Quick-setting cement hardens readily while the amalgam is still soft. This filling can be burnished, and the finished product combines the good properties of both, with few of the bad qualities of either. In badly broken-down teeth of children this is an excellent filling, and can be quickly introduced.

In the treatment of children's teeth, the care of the soft tissues and treatment of pits and fissures to prevent the ravages of decay is of great importance. If a child's teeth are soft and prone to decay, a diet should be prescribed such as will not only tend to build up the teeth, but strengthen the body as well.

Let us aim not to be mere tooth-carpenters, but rather laborers for the welfare of the future generation.

Dr. J. C. Salvas, Philadelphia. The paper and the discussion of this evening emphasize the importance of the proper care and treatment of children's teeth. Aside from actual operations on the teeth, the management of the child must be considered, for unless we have complete mastery of the young patient little or nothing of value can be accomplished in the treatment of the teeth. It requires the exhibition of great patience to gain the control and the confidence of the child, and it is necessary to be gentle and kind, firm but not severe. Another point the observance of which cannot be too strongly advocated is veracity—absolute truthfulness in our relation to children. The deception so frequently practiced on children is wrong and disastrous, to say the least. To assure a child that it will not be hurt, to ask it to open the mouth because you just want to look at the teeth, and then to take from your pocket or sleeve a pair of forceps and extract a tooth is wrong. We all know the result of such deception. That sort of practice is responsible, in a large measure, for the feeling of horror which so many persons associate with the dentist's office. The management of children is a psychological study, and if we understand their nature we shall succeed with them. The young patient's first visit to the dentist is generally a momentous occasion. Sometimes they come to us with eager anticipations, but more often in fear; in either case the introduction to the dentist and his work should be accomplished through a pleasant medium. I seldom, if ever, attempt to do any instrumentation on the teeth of a child until the second

or more often the third visit. At the first visit the teeth are examined and gone over with cotton saturated with some palatable solution such as cinnamon water or some other solution that appeals to the sense of taste. At the second sitting I go a little farther in the work by cleaning the teeth with the engine, and an orange-wood stick with pumice and even iodin. By this time the patient has become more or less accustomed to having the teeth treated without fear of being hurt. After the third visit I am generally able to do the work that is needed.

In regard to the various filling materials that have been mentioned this evening, little can be added as to their value. Copper amalgam is invaluable, especially in filling occlusal cavities. Gutta-percha also serves a valuable purpose, but I object to bridging interproximal spaces with that or any other material. If an approximal cavity cannot be made to retain a gutta-percha or amalgam filling, we have the copper cement, which is adhesive and admirably suited for such cases. The integrity of the interproximal spaces should be guarded just as much in children as in the adult mouth.

A medicament of great value in the treatment of children's teeth is silver nitrate. It is particularly applicable in treating shallow cavities or any cavity in which thorough excavation cannot be accomplished. For this purpose I use a saturated solution, applying it with a small pledget of cotton; this is followed with a few grains of sodium chlorid, which is burnished or rubbed into the silver nitrate, forming an insoluble compound.

Dr. J. C. Hertz, Easton. I wish to emphasize one point which the essayist brought out, namely, the use of pink gutta-percha in bridging over the space between two approximal fillings. I adopted that practice ten years ago, and have had considerably less trouble in handling children's teeth ever since. Some years ago I read a paper before one of the local societies in which I advocated pink base-plate gutta-percha as the ideal material for filling children's teeth, and called attention to my practice of bridging these spaces with it. I was very much censured by some of the older members, who claimed that it spoils the festoon of the gum and interferes with the anterior development of the jaw, but I have never found it to produce any bad effects.

Dr. P. B. McCullough, Philadelphia. I am glad to have the opportunity to pay my respects to the essayist and to say something of the work which he has accomplished in the clinic which he has organized in one of the New York hospitals. Dr. Wheeler is a pioneer in recognizing the importance of the treatment of children's teeth, and he is to be congratulated on the work which has been accomplished in New York by himself and a small circle of local dentists. His work has been very successful, and its limitations have only been due to the small number of men that he has been able to induce to assist him. This very large field requires so much attention that they seem almost unable to cope with it.

The importance of education in the care of the teeth has been emphasized, and I want to add some evidence to prove that this importance cannot be exaggerated. Recently a child of about seven years of age came under my care who had been ill with fever for three days; the physician, fearing serious ailments, watched the child for that length of time, and as no other symptoms developed beyond a temperature of 103°, he recommended that the patient consult a dentist. The child was brought to me, and on examination I found two deciduous abscessed teeth, with the glands at the side of the neck and under one arm badly swollen. The particular tooth which I believed to be responsible for the trouble was removed, and the proper surgical care was observed in the treatment of the wound. On the second day after the operation the temperature became normal. A short time after that, I had occasion to see a child of eight years who had been treated without any result by a physician, who said that he could not succeed in his treatment until the child's mouth was attended to. Several roots

were extracted, an abscessed tooth was treated, and in three days the eruption on the skin disappeared.

Dr. A. C. Barclay, Pittsburg. I have enjoyed the paper very much indeed, but I think that the essayist did not go back far enough in the treatment of children. We should care for children when their teeth are erupting, as a great many of them suffer for weeks during that time. Not long ago I treated a little child who had not slept to any extent for a week, during which time a physician was consulted, but could give no relief. I lanced the gum over three of the teeth, and the child was immediately relieved and slept well after that. Dentists are not called upon often to perform these duties for little patients.

Another thing that was not mentioned in the paper was the painless extraction of teeth. According to my experience teeth can be painlessly extracted with the use of beta eucain, no harm resulting from its use. Of all my child patients only one has resisted the injection of an anesthetic before extracting the tooth; all the other children come in laughing, and say they want to have a tooth taken out. We should work out this point a little, and see what can be done to make the extraction of these teeth painless to children.

Dr. Wheeler (closing the discussion). I wish to thank Dr. Schlegel for calling my attention to the fact that I omitted to mention silver nitrate. I agree with him and other speakers that silver nitrate is one of the most important drugs in assisting us to preserve the teeth of children, and we could hardly do without it.

Another point that I did not speak of is the destroying of the pulps of deciduous teeth. I rarely find it necessary to do so, but when I do, I still use the good old-fashioned method of arsenic application. I use arsenic fiber, and never apply it directly to the pulps of deciduous teeth; I am very careful not to lay it against an exposed pulp. I rarely note pain under these circumstances, and I have little fear of encountering serious difficulty, which is possible in deciduous teeth, but not in permanent ones.

In regard to the criticism of bridging the approximal cavities in the deciduous molars, I can scarcely agree with Dr. Salvas, for in order to avoid that method in some instances considerable cutting of sensitive teeth would be required, whereby an already frail and friable wall would be still further weakened. I should think that it would be desirable to lay a piece of gutta-percha carefully across the floor of both cavities in order that the gutta-percha may not be pushed out in the space between the teeth in such a way as to impinge upon the gum. In many instances, however, the use of gutta-percha in bridging over the approximal space in my opinion assists in stimulating the growth and development of the jaw, and I would scarcely know what to do in these cases if I were not permitted to use the bridging-over method.

I wish to thank the society for the interest that has been evinced in this paper, and for the many good suggestions which I have received from you.

The next order of business was the reading of a paper by Dr. Henry S. Upson, Cleveland, Ohio, entitled, "Nervous Diseases from Obscure Dental Disorders."

The meeting then adjourned until Thursday morning, July 1st.

Thursday—*Morning Session.*

The meeting was called to order Thursday morning at 10 o'clock by the president, Dr. Bratt.

The first order of business as announced by the chair was the reading of a paper by Dr. Joseph Head, Philadelphia, entitled, "The Obligations of the Dental Colleges Toward the Undergraduate."

After the discussion which ensued, the report of the Committee on Necrology was presented, as follows:

Report of the Committee on Necrology.

[The report, in addition to the following, submitted a brief record, with appropriate resolutions of regret, of Dr. C. N. Peirce, Dr.

W. F. Fundenberg, Dr. A. N. Gaylord, and Dr. M. B. Shuman—obituary notices of whom have already appeared in the pages of the Dental Cosmos.]

Dr. Harry Drane Urian.

Whereas, Dr. Harry Drane Urian, of 5037 Woodland ave., Philadelphia, after a lingering illness, as a result of mercurial poisoning contracted in the pursuit of his profession, departed this life August 27, 1908; and

Whereas, Dr. Urian was a member of this society in good standing, and a faithful and conscientious practitioner; therefore be it

Resolved, That we regret the loss of Dr. Urian, and that as a mark of respect these resolutions be spread on the minutes, and a copy be sent to his family.

Motion was made and carried that the report and resolutions be adopted and spread upon the minutes.

The meeting then adjourned until the afternoon session.

Thursday—*Afternoon Session.*

The meeting was called to order Thursday afternoon, July 1st, by the president, Dr. Bratt.

The first order of business was the reading of a paper by Dr. G. F. Bowman, Pittsburg, entitled "Some Fallacies in Orthodontia."

[This paper is printed in full at page 191 of the present issue of the Cosmos.]

Discussion.

Dr. J. V. Mershon, Philadelphia. I am very glad to open the discussion on a paper of which I so heartily approve. The essayist has most ably presented many of the mistakes that the dental profession has been making etiologically, as well as in their attempt at the correction of malocclusion. The paper is a most valuable one, as it is a well-established fact that we learn from our mistakes.

As I agree with the paper, I can only emphasize or enlarge upon some of the points mentioned, but the men who still adhere to the old teaching of extraction in treatment and to heredity as the great etiological factor will no doubt find a fertile field for discussion in this paper.

I should like to add one or two thoughts, which can hardly be spoken of as fallacies, but are most appropriate in connection with this paper. One is the failure on the part of so many dentists to recognize malocclusion, especially in the mesio-distal relation of the molars and bicuspids, as well as the great lack of appreciation of the value of normal occlusion. I say lack of appreciation of normal occlusion, because of the great number of children who are going to the dentist year after year with malposed teeth and with no effort being put forth to correct them, or, as is frequently told you, a dentist has corrected the teeth in the upper or the lower jaw, as the case may be. It is a physical impossibility to have malposed teeth in one jaw without having them in the other jaw; it is just as impossible to restore teeth to normal occlusion by treating only one jaw. That type of dentist cannot appreciate the value of normal occlusion, does not know it, is incapable of obtaining it, or is not honest with his patient. It is just the same with the man who tries to restore normal occlusion by extraction. I am certainly very glad to see the essayist take such a decided stand on the subject of extraction. I, like him, cannot comprehend how an author of a modern text-book can speak of restoring normal occlusion, and then immediately afterward speak of extraction for the correction of malocclusion. What can such a man understand by normal occlusion? Normal occlusion is impossible where extraction has been perpetrated. In regard to the esthetic and artistic side of extraction in malocclusion, anyone who extracts a permanent tooth in a child for the correction of malocclusion has caused a life-long physical deformity and marred the harmony and balance of the face beyond the possibility of complete repair.

The old fallacy of heredity, the small jaw of the mother and the large teeth of the father, is as logical and reasonable as it would be to expect the child to have the lower teeth of the mother and the upper teeth of the father.

In closing, I want to emphasize with all force the value of the early correction of malocclusion. The dentist must not wait until all the facial bones are established, then start to tear them down and rebuild them again.

Dr. D. W. Flint, Pittsburg. When the essayist gave me a copy of his paper he told me to criticize it severely. Instead I would rather emphasize some of the views expounded.

I was forcibly impressed by the essayist's remark that it must be either a brave or an ignorant man who would advise a patient to wait. We are sometimes in a very embarrassing position, when patients are sent to us for treatment and we are asked why they were not advised to consult the orthodontist sooner. We have to protect ourselves and the men who send us the cases, and the only way to solve the dilemma is to tell the patient that in the past the theory was to wait until all the teeth had arrived before beginning the treatment for irregularity. But I believe the period has arrived when dentists should know better and should give better advice, and as the essayist has said, it is a reproach to the man in charge when we get such hideous cases as come to us from day to day.

In regard to extraction, I have to say that some men know nothing of the law of occlusion. Only recently I had three cases sent to me in which extractions had just been performed, with the expectation that the case would be the more easily corrected, whereas if all the teeth were present it would be a much simpler matter. How are we going to treat these cases? We simply have to do the best we can for them, and take it for granted that the patient is ignorant, and the dentist more so.

In regard to rapidity of treatment, one of the best papers I have ever read on this subject was one by Dr. Watson of Detroit, in which he shows that we must do the work slowly if we wish to bring about the full development of the face. In this connection I shall never forget Dr. Ottolengui's remarks, who told of the case of a child that he took away to the country with him in order to watch the case and to prevent the appliances from correcting the conditions too quickly. In a great many cases slowness of the work seems to be essential.

Dr. S. P. Cameron, Philadelphia. When called upon to discuss a paper presented to any scientific organization, we can usually find some portion to which we would take exception. I am pleased to say that there is not a single point in which I do not fully agree with the essayist.

Dr. Bowman has presented some plain, simple facts which show that some of the accepted theories concerning orthodontia are scientific fallacies, as has been proved by scientific investigation carried on by the most eminent students of dentistry in the world today. In entirely agreeing with Dr. Bowman I may not be agreeing with a great many of my hearers. I fear there are men in this audience who resort to extraction in the treatment of class II of Dr. Angle's classification. Their reason, as given to themselves and their patients, is that they can thus obtain the best results. I would not ask, Does Dr. So-and-so do it? but answer the question yourself, Do you do it? And if you do it, ask yourself, Why do you do it? Do you fully understand the histological changes incident to tooth-movement? When you place a mechanical appliance in the mouth to correct a malocclusion, do you study the movement to be produced as a mechanical moving of the teeth, or do you insert the appliance to cause a tissue change and thus assist nature in producing the harmony which was originally intended? Or do you send a cast made from a modeling compound impression to a laboratory to have an appliance made to treat the case in hand, expecting the technician to study out your treatment for you? If you do, you can never hope to advance in this important subject, far less establish normal occlusion. Or do you make careful plaster impressions and casts of each case which you attempt to treat? and do you study out carefully the exact position that each tooth in both arches should occupy to establish normal occlusion, not as a whole, but each individual inclined

plane on each and every cusp on each and every tooth? If you do this, and have a knowledge of the histology and physiology of tooth-movement, then avoidance of these fallacies pointed out by your essayist will appeal to you, and you will not be casting about for an excuse for advising extraction or delay of treatment. Your mind will be at ease, for you will know that you are right.

Or are you advising parents who put their children into your charge with all confidence in you, to permit you to commit a blunder which when you find it out you cannot repair? If any of you are doing this and resting satisfied on these fallacies, you are committing a crime not only against your patient but against the dental profession, and the time is not far distant when these blunders will be brought home to you most forcibly. The world is full of good literature on orthodontia today, so that there is no excuse for your not knowing the fallacies the essayist has pointed out. The time has gone by when you can rest securely on these old false theories; nor can you continue to live in ignorance, unless you refer every child from five years of age up, to a competent orthodontist. This I would consider a shame and a disgrace to your D.D.S. degree, because you cannot practice dentistry as you ought, nor can you give the assistance you ought toward maintaining and so promoting the high standard of dentistry which we all desire. You ought to know normal occlusion and should be able to diagnose malocclusion as given to us in Dr. Angle's classification, which is the accepted classification of today.

Retention in a great many cases is more or less difficult because most of the cases have been allowed to progress so long, and have thus become more complicated every day from perhaps three or four years of age on, up to twelve, sixteen, or even twenty years, so that almost every tooth has to be moved when the active stage of bone-building is completed. How easy it would be to treat these cases early, at the period of eruption of the first permanent molar or sooner, and to assist nature to guide each tooth into its proper position! At that early period retention would be simple, positive, and easy. The harmony and balance of the facial lines would be as nature intended them to be, according to the particular type of each individual. If you have treated a patient of from six to twelve years of age thoroughly and well, I care not what your result will be, if it is as nature originally intended it. You have done your whole duty and can deserve no censure.

The systematic treatment of malocclusion on a scientific basis started from a very small nucleus but a few years ago, after three hundred and fifty years of theorizing. In this brief time it has taken on such huge proportions that its recognition is demanded in dentistry and medicine, and by the public. False theories have been laid aside, and very soon those who cling to them will be compelled to abandon them and to build upon scientific facts.

I wish to congratulate this society on having Dr. Bowman as one of its members, and also my fellow practitioners of this city on having a man among them who has so strongly the courage of his convictions as to come out and read this paper and to ably maintain every one of his statements.

Dr. T. E. Weeks, Philadelphia. I shall discuss this paper not from the standpoint of the orthodontist, but from those of the practitioner and the teacher. There is no question in the minds of the majority of the profession today that the treatment of irregularities of the teeth must be placed in the hands of men especially qualified for that work. It is incumbent upon us for the benefit of our patients to maintain the proper relationship between the profession at large and the specialist. In the first place there must be confidence, and I am pleased to see in the minds of the profession a rapidly growing confidence in the constantly increasing body of men who are taking up the specialty of orthodontia, and you must agree with me that the *personnel* of these men is good; they are able in the main to do efficient work, and

are trustworthy. It is necessary in my opinion for every dentist to have at least an academic knowledge of orthodontia. In this connection I will speak of a movement that was on foot in New York a year ago last winter. The New York Study Club engaged an orthodontist of some reputation and ability to conduct a series of lectures, illustrated with lantern slides and models, and impart to them this academic knowledge. Being in intimate contact with members of that club, I know that these men were benefited by the movement, and I would suggest that in every community where there is a sufficient number of dentists, they employ the services of some competent person to give them the knowledge necessary for them to recognize the existing conditions so that they can at least intelligently refer the cases to the specialist. I would urge this as one of the subjects which it would be most profitable to take up in a study club. Incidentally, I believe that the study club is to be an institution of the immediate future, and no subject that such a body could take up would be of greater advantage than this academic knowledge of orthodontia. We have heard enough at this meeting to convince us that the diseases of the mouth and teeth will be minimized when we have two continuous arches with perfect occlusion. Some of the diseases which Dr. Black has illustrated on the screen would not exist if these two conditions prevailed; and if we would have perfectly healthy mouths and perfect function of the teeth, we must have two continuous arches and perfect occlusion.

I congratulate the society on having placed upon the program a paper of this kind, and on their selection of the essayist. I am glad to recognize in Dr. Bowman a valuable addition to the ranks of orthodontia, for so many men in which I have great admiration and confidence.

Dr. G. V. Black, Chicago, Ill. I would like to say a few words on a different phase of what perhaps is not generally termed orthodontia. But a word first as to the man who waits—the essayist has said that he must be either brave or ignorant. I suspect that often he is really brave, that he is able to see that his case is in process of self-correction, and is brave enough to act upon this conviction and to wait. Generally the reverse is the case.

I have treated for some years a great many cases of supernumerary teeth in which there have often been great distortions of the mouth and bones of the face, and I have learned to wait for the correction of these deformities. The more I wait the more I wonder, for during the period of active growth of the bones of the face, nature will produce an accurate shape if she has a chance to do so. In cases in which the incisors in a child are spread widely apart, lifting the lip because of supernumerary teeth, and leaving a wide breach when the supernumerary teeth are removed, it is best to watch and wait and to see what nature will do. For as soon as nature gets a chance she will begin to shape up the mouth. I have many models which I think would astonish some of you, where teeth have been very much out of position owing to supernumerary teeth, and yet later, in about a year, the mouth took on normal shape. Some time ago I observed a young patient with four full-sized central incisors, all of which were quite normal in form, so that for a little while, until they came a little farther through the gum, it was a question which it would be best to retain. I extracted two of these teeth, leaving those farthest out of position. The case came back to me one year afterward showing no sign that there had ever been any irregularity. I have observed many of these abnormalities caused by supernumerary teeth. But if the dentist waits in such cases until the formative period of the jaws has passed, he will wait in vain for such correction. In one woman, who applied for some treatment, I found eight incisors between the canines, the mouth and whole face abnormally broad, and the lower teeth spread apart in the incisal region; yet this patient was going through life with that abnormality. She said her parents had taken her to several dentists in her childhood, and they had

all said that nothing could be done. She was then nearly forty years old, and she said that this had been a blot upon her life, and that she could never get over it. I then promised myself that I would never allow one of these cases to get out of my hands without being corrected. This case could have been corrected by extracting the right teeth at the right time, and this woman would have had a very beautiful face instead of an abnormal one.

I recall another case illustrating the fact that proper attention is not being given to this class of cases. A little girl came under my treatment not long ago. Her mother sent her to me because her teeth did not look right, and she wanted to know what was the matter. Her deciduous incisors had fallen out and another tooth was erupting twice as large as the normal teeth. I extracted that tooth at once, and one normal incisor erupted. In less than a year I found another big tooth in the position of the delayed normal incisor, and extracted it without a moment's hesitation. In the course of a year no permanent tooth had appeared (that was before the time of the X ray). I put in a plate to hold the teeth in position so as to preserve space for a second permanent incisor, and the patient wore the plate for two years. Two years afterward the patient complained that the plate hurt her mouth and that her gums were sore. I removed the plate and found the incisal edge of a normal incisor protruding. I immediately discarded the plate, and in the course of a few months she had a perfect set of teeth. Without that treatment the beauty of the lines of that girl's face would have been ruined, and her life would have been blotted.

My object in speaking of this phase of orthodontia is to emphasize the point that in orthodontia work during the formative period of the face, during the period of the growth of the teeth, nature instead of opposing you will, if you interpret it aright, be a great aid in accomplishing results.

Dr. W. G. Ebersole, Cleveland. Although not an orthodontist, I am grateful for having been permitted to listen to this excellent paper.

The question of pain and suffering caused to young patients has impressed me very much. I am very glad to know that orthodontists are realizing more and more the necessity of operating slowly during the period of development. The fact that they are now able to eliminate pain, and thereby many of the nervous symptoms in children the effect of which we are unable to estimate, seems to have forcefully influenced the orthodontist. We do not know how much of an effort nature is putting forth in trying to correct these conditions so as to avoid impacted teeth. On the other hand, according to Dr. Black's statement, nature is always tending to produce the normal. Therefore, if there is some obstruction which prevents nature from reaching the normal, the question is whether we are able to judge the amount of force that nature is applying in that direction, so that we may fulfil our object and aid nature in its efforts. A child in school is called upon to devote its energies along certain lines, and the change that takes place in the physical economy of children under the influences of their work seems to me to be a field for future observation of the orthodontist. A record of all the conditions surrounding the children should be made, the whole juvenile system should be considered, corrections be made, and then a chart compiled to show the influences of the treatment upon the child's physique, not alone upon the face, the expression, the ability to chew food. Thus it would be shown whether malposed teeth are not causing a drain upon the system, keeping the vitality of the child below normal.

Another question which the essayist has spoken of is the number of cases of malocclusion that come under observation. I have in my hand the record of the examination of three thousand school children of the public schools in Cleveland made by the dentists of that city, and I wish to read it to you in further substantiation of what the essayist has said:

REPORT OF EXAMINATION OF PUPILS OF PUBLIC SCHOOLS IN CLEVELAND.

	Murray Hill.	Doan.	Waterson.	Marion.
Condition of mouth—*Good*	346	132	135	244
" " —*Fair*	381	429	99	336
" " —*Bad*	134	117	63	241
" gums—*Good*	594	504	221	477
" " —*Bad*	253	169	73	300
Use tooth-brush—*Yes*	101	524	193	243
" " —*No*	762	161	100	455
Teeth filled—*Yes*	9	275	102	72
" " —*No*	843	404	191	707
Malocclusion—*Yes*	230	421	93	343
" —*No*	633	252	169	308
Teeth containing cavities	(?)	641	257	745
Teeth extracted	(?)	89	14	125
Nationality—				
American	25	657	198	116
German	4	1	20	73
English	4	6	45	11
Italian	828	1	7	16
Russian	1	. .	. .	420
Slavish	1	. .	. .	. .
Bohemian	. .	1	. .	. .
Swedish	. .	2	3	. .
Irish	. .	. .	. .	9
French	. .	. .	1	. .
Norwegian	. .	. .	7	. .
Polish	. .	. .	. .	49
No. of pupils examined	864	691	298	824
" perfect mouths	62 (7.17%)	20 (2.89%)	14 (4.69%)	13 (1.57%)
" defective "	802 (92.83%)	671 (97.11%)	284 (95.31%)	811 (98.43%)
" cavities	3920	4294	1342	5505

Dr. BOWMAN (closing the discussion). Evidently the discussion has been in the hands of my friends. It is always hard for me to speak connectedly from notes hastily taken during a discussion, but a few thoughts came to me as the different gentlemen were speaking, and I wish to emphasize these.

Drs. Cameron and Mershon spoke of the lack of recognition of malocclusion by the general practitioner. This is unfortunately true, and offers one of the most fertile fields for improvement in the whole realm of general practice. It is not too much to expect, I hope, that these cases will be recognized earlier than they have been heretofore, and not allowed to develop until all who run may read.

I confess that when I was in general practice, the etiology of those (class I) cases in which the malocclusion is largely confined to the incisor region puzzled me. Many of the children were in my charge from infancy up, and I tried to do my whole duty, but when the upper incisors commenced to erupt they would be rotated, and I would worry and wonder about it, never thinking to look at the lower incisors or to go even farther back and watch to see that the normal widening of the arches, as indicated by the spacing of the deciduous incisors, was taking place. If the deciduous in-

cisors are not spacing properly by the fifth year, do something to aid nature before any of the permanent incisors erupt, or, if you do not see the child until a lower central or lateral is erupted or erupting lingually or labially to its normal position, or rotated, it is still not too late to expand the deciduous arches; but if nothing is done, and even one lower central or lateral incisor erupts in malocclusion, you may be sure that it will be reflected in the upper arch.

It is these little beginnings that are but ought not to be ignored. If you start early enough, the buds of the bicuspids are locked in the roots of the deciduous molars, and if the deciduous molars are carried buccally the bicuspids must go along, all by gentle pressure without annoyance to the most delicate child.

Dr. Cameron emphasizes the fact that there is no good reason why every general practitioner should not treat the malocclusions in his own practice. There is no good reason, provided he is prepared; but by all means prepare yourselves before you try to treat malocclusions—for the child's sake if not for your own.

Each man knows in his own heart whether or not he is capable of establishing normal occlusion, and if he is not, he is not acting honorably to the parent who trusts him, to the child who is dependent on him, or to himself. I protest with all the vehemence possible against the too common practice of dentists accepting cases for treatment with no conception of what is to be done or how to do it, and with a hazy idea of putting on expansion arches, and expanding something, someway. If you can do it, do it. If you cannot, be honest, and send these patients somewhere where it can be done properly. Do not carry the child along, deceiving the parent until the period of active bone-growth is past and little can be done by anyone. There *is* a normal occlusion and it *can be* established. I am not saying this for the purpose of soliciting references, but rather to save these little children, who are to be the men and women of tomorrow, the physical handicap and mental suffering inherent to deformed faces. The physical handicap in adult life is serious enough, but that is not to be compared with what these patients, knowing that they are marked, suffer mentally throughout their lives.

It was both a surprise and a pleasure to hear Dr. Black testify to the wonders that nature will perform in the correction of the malocclusions caused by supernumerary teeth, provided the supernumerary tooth is removed; but I assume that practically all of these were incisors, for in these, lip pressure would do the most toward equalizing the arches.

Dr. Black. The greater number occur really in the incisal region.

Dr. Bowman. I have no doubt that it is best to treat these cases as Dr. Black suggested, but simply because nature will correct a case in which you extract supernumerary teeth, do not vainly imagine that nature will correct other cases in which the occlusal inclines are out of harmony.

Dr. Black. No, such cases will grow worse.

Dr. Bowman. Dr. Weeks makes the statement that only when normal occlusion is present can we have a healthy mouth. This important truth is being more and more appreciated, but in considering the local effect of malocclusion, let us not lose sight of its more obscure effects. I refer not only to the deformities of the maxilla and mandible, but to those of the facial bones, and it is not too much to say that in many such cases the whole physical development is retarded. It may be argued that the malocclusion—*per se*—has no effect on the chest, etc., but that adenoids or other nasal occlusions are the cause. Let us grant that; but unfortunately, in at least a large number of cases caused primarily by mouth-breathing, the removal of the adenoids or any other obstruction in no way benefits the child unless normal occlusion is established, for the nasal chambers are undeveloped and unable to functionate, and the very positions of the teeth are a bar to normal breathing, it being impossible for the child to close the mouth. So, while the adenoids are the primary cause, they very rapidly become of secondary importance. The

rhinologist is realizing this more and more, but even yet less than he ought.

Dr. Ebersole's statistics are interesting, but I venture the assertion that a far larger proportion of those Cleveland public school children are suffering from malocclusion than his records show, as he will probably admit that the examination of the occlusion was more or less casual.

Dr. Ebersole's suggestion that careful records of the effect of treatment on the children's health, etc., ought to be kept is very good, and I am glad to say that the consensus of opinion among men who have already taken the trouble to do this by weighing patients before, after, and during treatment, etc., is that the results are invariably good.

In closing, gentlemen, I wish first to thank you for your attention and interest, and second, to make a final plea that you do something for these children whose parents are trusting you; do not let them go through life with a distorted physiognomy!

Dr. MERSHON. I have heard a great many complaints voiced by members of the profession in regard to the danger involved in treating the teeth of children in malocclusion by harming the developing teeth. I should like to hear Dr. Black's opinion on this subject.

Dr. BLACK. I have never posed as an orthodontist, but I have done a great deal of that orthodontia that was practiced in the last century when we did not have the appliances that are now at our command. Those appliances were rather crude, and so was the knowledge of the importance of the position of the teeth. I have seen teeth that were made so sensitive by those appliances that it was hard to induce a child to come back again; I have seen inflammation produced by those appliances, and pulps destroyed. Yet, if you could have seen those mutilations you would have wondered how few pulps were destroyed, and you would not be afraid of destroying pulps with the modern apparatus. Over and over again I have seen teeth so loose that I thought they would have to be ligated in the mouth, and yet those teeth were vital. There is really very little danger of destroying pulps in developing teeth by the fairly careful use of the orthodontia appliances of today. The young orthodontists of today have probably never seen the pulp of a tooth destroyed, and the fear expressed by Dr. Mershon should therefore be banished completely. In every child that comes under my treatment at or near the period of eruption of the permanent first molars, I carefully observe the intercusping of these teeth as they come into occlusion. Everyone should watch that. When a child comes about the time of eruption of these teeth, see that the intercusping is normal, and if it is not, correct it then.

Dr. WEAVER, secretary, then presented the report of the Executive Council.

Motion was made and carried that the report of the Council be received and adopted.

The next order of business was the installation of the newly elected president, Dr. DeLong, after which

Motion was made and carried that the society adjourn until the next annual meeting.

CLINICS.

Dr. W. A. MCCREADY, Pittsburg. "Small Set of Office Rolls."

Dr. McCready exhibited a set of office rolls and spatulas for rolling gold.

Dr. C. W. B. WHEELER, New York, N. Y. "The Jackson System of Orthodontia."

Dr. Wheeler showed the different forms of the Jackson appliances and their uses, also the materials and tools used in making the appliances.

Dr. W. B. MILLER, Altoona. "Pyorrhea Pen for Applying Medicaments in Pyorrhea Pockets."

Dr. Miller demonstrated the use and practical utility of the Miller pyorrheal pen for making medicinal applications in the treatment of pyorrhea and other alveolar complications. The clinician claimed that this was the only rational device yet put upon the market for this work.

Dr. J. Maurice Crosby, Bradford. "Fixed Bridge Work Without Displaying Gold or Destroying the Pulp (Anterior Teeth)."

Remove enough of the lingual surface of the tooth to give body to a plate of gold. Make parallel pinholes between the dentin and enamel on either side of the pulp, and fit iridio-platinum wire, round and previously threaded with the tap of the Bryant bridge-repair outfit, and take impression with the pins in place. Cast separately, put the two pieces to place in the mouth, take impression and bite, and finish. Before cementing the bridge to place, thread pinholes with a tap a size larger than for threading the pins.

Dr. W. W. Booth, Carnegie. "Gold Inlays for Approximal Cavities Faced with Jenkins Porcelain."

After the wax model is perfectly made, remove it from the cavity, mount upon a sprue wire, and then by the use of the Roach suction appliance suck from the face of the inlay enough of the wax to allow for the fusing of the Jenkins low-fusing porcelain directly into the gold inlay, after it has been cast. In sucking out the wax leave a fine marginal line, and enough on the occlusal surface to protect the porcelain from the stress of mastication. Large inlays of bicuspids and molars exposed to view can be made in this manner very quickly and easily, and are necessarily inconspicuous.

Dr. C. L. Kemery, Pittsburg. "All-Gold Cast Crown."

The tooth is beveled on all edges. A matrix is placed around the tooth, and a wax impression is taken of the tooth. The matrix is then removed and the center of the wax is removed by a hot syringe. A cap of wax which is softer than the wax of which the collar is made is attached to the wax collar. The wax crown is then placed on the tooth, and the patient is instructed to bite on the wax to get the occlusion. The wax crown is now contoured and invested ready to cast.

The clinician claims for the crown made by this method that a cervical border can be obtained that will not irritate the gums, and a perfect occlusion.

Dr. A. S. Koser, Harrisburg. "Methods and Appliances in Plate Work."

In full upper plates in cases where there are only the six lower anterior teeth present, tipping can be overcome by leaving out the upper canines and allowing the lower canines to articulate with the first upper bicuspids. The space is filled by the use of an extra molar or an extra bicuspid on each side.

Dr. J. A. Boarts, Greensburg. "Missing Teeth Supplied by Roach Attachments."

The claims made by the clinician for the Roach method are—That it is unnecessary to mutilate the abutments; that the appliance does not irritate the gums as partial plates do; that it is more sanitary than fixed bridge work, less expensive and less difficult to make than removable bridge work, and that in most cases the pins can be placed in position without devitalization of the pulp.

Dr. J. A. Rupert, Meadville. "A Simple and Accurate Method of Taking the Bite and Assembling a Bridge."

Prepare the abutments and place them in the mouth. Mix plaster and spread it freely over the abutments and opposing teeth, and have the patient close the mouth. When the plaster is hard, remove it together with the abutments and place it in an impression. Pour the impression side with the abutments in place with investment compound, and, when it is hard, pour the impression of the opposing teeth with plaster and place it on an articulator. When the investment has hardened, break away the impression, and the abutments remain on the articulator in perfect occlusion.

Dr. C. V. Mierley, Huntingdon. "Manipulation of the Oxyhydrogen Blowpipe."

The device shown was the Lane-Seymour Oxyhydrogen Blowpipe. It is more particularly intended for fusing gold in casting operations, or wherever an extremely high temperature (4500° F.) or quick results are desired. It is, however, equally efficient for any and all soldering apparatus. (There being no illuminating or natural gas in the build-

ing, the device could not be shown in operation.)

Dr. Ross Porter, Oil City. "Wax Models for Gold Castings."

Take, for example, an approximo-occlusal cavity in a bicuspid. Adjust the matrix and wedge it at or below the cervical margin. Warm the wax and shape it to a point. Force the wax into the cavity as deeply as possible, then with a hot burnisher melt the wax to the bottom of the deeper portions of the cavity. Just before the wax sets, force the cone of cold wax into this. Remelt the surface, and have the patient close the teeth together, but do not allow him to chew on the wax. Chill the wax and trim approximately. Heat the surface of the wax with a hot-air syringe, then have the patient chew on the wax. Trim to shape and chill the wax, remove the wedge and matrix, and lift the model out of the cavity with two exploring points.

Do not remove the wax from the cavity until it is finished, and do not replace it in the cavity after once removing it.

Dr. E. B. Lodge, Cleveland, Ohio. "Solid Gold Molar Crown for a Badly Broken-down Root."

For badly broken-down roots of molars use a suitable post of platinum or other suitable metal. Produce a foundation in pure gold by an inlay method. Try this foundation upon the root, and burnish the thin edge well down upon the root margin to insure a close fit. Place wax into this foundation, and try it in the mouth to secure proper contact, and correct the occlusion. Shape the wax to a natural and artistic form, insert it upon the root and place the sprue wire in position. This is then withdrawn and invested a second time and cast with 22-k. gold upon a 24-k. foundation, thus producing a solid gold crown.

The advantages claimed for this crown are—A better fit is likely to be obtained by burnishing the pure gold upon the root; the result is better than from a band crown, as there can be no irritation of the gum if a properly fitting inlay is secured; it can be employed in cases where a band crown cannot be fitted because of extensive decay of the root.

Dr. J. C. G. Fitz-Hugh, McKeesport. "Cast Gold Inlay with Porcelain Face."

Prepare the cavity as for any inlay. The labial cavo-surface angle to be restored with porcelain should be prepared at right angles to the surface of the tooth upon which it occurs. The lingual cavo-surface angle should be beveled as for any gold inlay.

Burnish a thin piece of pure gold or platinum matrix material into the labial half of the cavity. Put in the wax, and carve it up to a full contour. Then carve out the labial surface of the wax, allowing sufficient retention for holding the porcelain. The inlay is then cast, after which it is placed in the cavity and burnished down perfectly, and all of the matrix that is overhanging the outer surface of the tooth is removed, leaving a very thin and well-defined margin to the matrix where the porcelain will abut the enamel.

Low-fusing porcelain is then baked into the labial surface of the inlay, reproducing the color of the tooth.

Dr. H. C. Neale, Pittsburg. "Hollow Metal Cast Crowns."

Prepare the root in the usual way. Fit the band of 22-k. gold, No. 30 gage, and contour as desired. Fill the cusp with inlay wax and have the patient bite into the wax, and carve the cusp to proper contact, after which it is chilled and removed from the mouth. Then with a Roach chip-blower suck out the excess wax, insert the sprue wire, invest and cast the same as with any other casting.

Dr. C. E. Peters, Pittsburg. "Nitrous Oxid and Oxygen as an Aid in the Painless Preparation of Cavities in Hypersensitive Teeth."

A cavity on the gingivo-buccal surface of a lower first molar was opened and prepared without causing any pain to the patient. Large round and inverted-cone burs were used, and the cavity margins finished with chisels and carborundum points.

During the operation the patient was breathing through the Teter Nose Inhaler a mixture of nitrous oxid and oxygen in almost equal proportions.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

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PHILADELPHIA, FEBRUARY 1910.

EDITORIAL DEPARTMENT.

CONCERNING MONEY AND SOME OTHER THINGS.

HERBERT SPENCER placed the various kinds of knowledge in the following order of their relative worth: "That which prepares for direct self-preservation; that which prepares for indirect self-preservation; that which prepares for parenthood; that which prepares for citizenship; that which prepares for the miscellaneous refinements of life." While he regarded the foregoing as a rational order of relationship in the purposes of education, he made no pretense that these divisions were definitely separable. Under the second division, "indirect self-preservation," he included a knowledge of those activities concerned in securing the necessaries of life—the industrial functions by which one acquires the means of living. This division logically precedes the other divisions relating to parenthood, citizenship, and the miscellaneous refinements of life; for until the means of subsistence are obtained, until the necessaries of life which indirectly minister to self-pres-

ervation are acquired, the succeeding stages of human activity become impossible.

So clearly and so generally is the primary importance of securing the means of subsistence recognized that in the average human mind it is magnified and distorted out of all proportion to the other and subsequent orders of human activity, so that it has become an end in itself rather than a means to other ends in its normal order of relationship. The child at school is trained to the end that he may grow up to be a self-supporting man; the boy at college looks forward with feverish impatience to the time when he shall be able to get out into the world and earn his living, make money, be successful—and his ideal of the standard of success is as the average of the world measures success, in terms of wealth. From the kindergarten throughout the whole educational system and thereafter, the ideal of pecuniary reward as the coefficient of success, of attainment, is the alluring hope ever before his mental horizon, the stimulus which drives him on to renewed activity.

It matters not whether the products of this materialistic system of training adopt a commercial or a professional career, for in both instances they are governed by the same ideal of acquisition; the only difference being that in the first case the money-making object is openly and frankly avowed, whereas in the second it is hidden under the cloak of a hypocritical philanthropy or professional altruism, and in some instances it is not hidden at all.

Our dental colleges, depending upon the preparatory schools for their student patronage, are filled with youths whose enthusiasm is mainly if not wholly begotten of the expectation that at the end of the curriculum they will be in possession of the documentary evidence that they are licensed to make money by the practice of their special profession, and they enter upon their careers with minds sodden with the greed of money-getting as the whole duty of man. Every teacher knows that the proportion of students who are animated by an interest in study for its own sake, whose intellectual horizon reaches beyond the money ideal as an objective end, is a minor one. Every teacher knows that the desire to render the least amount of intellectual service in return for the coveted diploma is a feature of student ineffi-

ciency which constitutes the most serious obstacle in his work as a professional educator. And every teacher knows also that it is this same shortsighted and distorted view of the correct relationships of indirect self-preservation to the other and subsequent orders of education and knowledge that makes the weaklings among our graduates take the unethical short cuts to the attainment of their ideal of financial professional success.

In the foregoing critical presentation of the case it is to be clearly understood that its application is to a well-recognized condition, a stage of development characteristic of a considerable proportion of men undergoing training in college for their life-work—a stage which the majority pass out of sooner or later when a larger experience has increased their range of intellectual vision. It is regrettable, however, that in the preparation for professional life more cannot be done, or at least is not done, to minimize the importance of the money-getting ideal to the extent of enabling the embryo practitioner to see it in its normal relations to the other classes of life activities as set forth in the Spencerian category which we have herein quoted. Let there be no misunderstanding as to the importance of those "industrial activities" which lead to self-maintenance and without which personal independence and the essential attribute of self-reliance as well as personal freedom are impossible. What is needed is an orientation of the money-getting ideal so that the mind of the student can comprehend it in its correct relationship to the other interests and activities of life. No formal set of lectures upon dental ethics will have the slightest influence in making for an ethical dental profession while the belief is ingrained in the mental texture of the student that to make money is not only his first but his only duty as a practitioner and as a citizen.

The reflex of this inverted view is more broadly manifest at the present time than ever before in the history of dentistry, if we are able to read the signs of the times correctly. Throughout the whole world of dentistry there is a focusing of attention upon the importance of dentistry and dental hygiene to the public health. The public has given sympathetic heed and attention to the reiteration of data which demonstrate the necessity of oral cleanliness and dental soundness as health measures; the propaganda of education in dental matters has produced its effect upon

the public mind, creating a demand for the extension of dental service in all directions. The money-maker, both within and without the dental profession, with his sharpened instinct of acquisition, has read the handwriting on the wall, and by devices both open and insidious is endeavoring to commercialize what in its essence is a philanthropic and professional situation. Dental journals are catering to this commercializing tendency by holding out to the weaklings the bait of larger professional returns by the adoption of so-called "business methods" in practice. Dealers in dental goods and the manufacturers of nostrums are promoting so-called "campaigns of education" for the openly avowed purpose of increasing their volume of sales, and the attempt is made by seductive offers of financial and other forms of help to aid in the propagation of the legitimate movement now active for widening the spheres of public dental service.

Let us stop and realize the situation. We are confronted with a condition of affairs upon the correct solution of which the very existence of ethical professional dentistry depends. If this wholesome movement for the popularization of dental service is to be annexed to the forces of business commercialism, not only will it fail of a successful issue, but the one great and conspicuous opportunity, the most definite and important in our professional history, for placing dentistry upon its proper plane in public estimation will be lost, and lost from causes which will degrade our status beneath that of the advertiser and nostrum-vender. That the situation is a critical one at the present time we are led to believe not only from the evident commercial activities which in a public way are now interesting themselves in the movement toward popularizing dental service, but because of numerous letters received at this office expressing anxiety if not alarm at the magnitude of the commercial factor which has been permitted to attach itself to this phase of professional interest. Let no dental organization part with its ethical birthright for the mess of commercial pottage, and above all, let every man interested in securing for his profession the status to which it is inherently entitled use his best effort to neutralize every attempt of a sordid commercialism to annex itself directly or indirectly to this distinctly professional prerogative.

BIBLIOGRAPHICAL.

DENTAL MATERIA MEDICA AND THERAPEUTICS, WITH SPECIAL REFERENCE TO THE RATIONAL APPLICATION OF REMEDIAL MEASURES TO DENTAL DISEASES. A Text-book for Students and Practitioners. By HERMANN PRINZ, M.D., D.D.S., Professor of materia medica, therapeutics, and pathology, Washington University Dental School, St. Louis; Chairman of the Committee of Revision of the United States Pharmacopeia, Section of Stomatology, American Medical Association. 586 pages and index, with numerous illustrations. St. Louis: The C. V. Mosby Medical Book and Publishing Co., 1909.

The special qualifications of Dr. Prinz for the preparation of a text-book upon dental materia medica and therapeutics are well known, and the announcement made some time ago of his intention to produce such a work has led to the expectation that when issued it would be a work of the first order of merit. That expectation has been fully realized.

In the scientific investigation of pharmacology and therapeutics which has been progressing for the past two decades, the line of development has been toward rationalism in the use of drugs to an extent which has almost revolutionized the older methods of treatment. This rationalistic attitude pervades all of Dr. Prinz' work in the development of the special subjects included within the title of his book. In the beginning he creates a proper mental attitude on the part of the student so as to enable him to understand the progressive unfolding of the several topics treated of and thus lay a foundation for their intelligent use in practice.

A brief history of the development of thought with reference to pharmacology and therapeutics, clearly defining the distinction between rational and empirical therapeutics, forms the opening section of the book, and reveals to the mind of the student the progress which has been made in therapeutic science. The object and aim of therapeutics is next discussed. Incidentally, and as illustrations of what the author describes as "pharmacologic fetishisms," the author takes exception to the idea of administering potassium chlorate with the intention of exerting a beneficial influence on all forms of disease in the mouth by the liberation of nascent oxygen. He similarly classifies the use of potassium iodid and sulfureted lime under the treatment of disturbances arising from general infection. Elsewhere in the work the author again refers to the poisonous character of potassium chlorate when administered internally, and mentions instances where this drug has exerted its poisonous effect even when used in solution as a mouth-wash.

It is regrettable that the evidence in favor of the author's point of view with respect to potassium chlorate was not included in defense of his position, for while the theories which have been promulgated with respect to the pharmacology of potassium chlorate may have been

incorrect, the belief in its usefulness as a therapeutic agent in the treatment of certain conditions of the buccal mucosa will require something more than the author's unsustained *ipse dixit* to overthrow it.

In the historical portion of the work, at page 25, we note a typographical error with respect to the date of the introduction of nitrous oxid as a general anesthetic by Horace Wells. The date is printed as 1884; it should be 1844.

In the section on "Selection of the Remedy," which is concluded by a classification of therapeutic methods, the author refers to the extremes which have characterized medical thought regarding the action of remedies even at so recent a period as that of Skoda and Dietl (1830 to 1870), whom he quotes as saying "There are no real therapeutics, there are only lucky physicians;" and further says, "Bearing in mind the fact that no tangible knowledge of pharmacology existed at that time, our judgment of these outbursts of over-zealous minds is materially modified when we consider that even at this day the drugless 'Christian scientist' and the supporter of the 'Emanuel movement' hold sway over the minds of the credulous." At the close of this section the author makes a convenient division of therapeutic methods under four heads, number three of which relates to Psychologic Therapeutics, or Iatropsychics, and says: "They are principally concerned with the psychologic influences exercised by the physician on the patient. Especially are nervous diseases amenable to this method of treatment, although certain bodily functions may also be materially influenced by the method." It would have been interesting if the author had elaborated this division of his subject somewhat more extensively and made a little clearer the distinction between what he regards as legitimate iatropsychics, *i.e.* psychologic influences exercised by the physician on the patient on the one hand, and on the other the psychologic influence which the "drugless Christian scientist and the supporter of the Emanuel movement exercise over the minds of the credulous." It seems from the author's text to be largely a question of who is the patient and who exercises the psychologic influence.

"Methods of Administering Medicine," "Prescription-writing," "The Pharmacopeia and Pharmaceutic Preparations," are valuable sections which precede Part II of the work, devoted to Pharmacotherapeutics. In this latter division the consideration of various drugs is divided into sections relating to anesthetics, astringents, antiseptics, hemostatics, styptics, protectives, demulcents, emollients, irritants, counter-irritants, bleaching agents, preparations for the mouth and teeth, local anesthetics and obtundents, general anesthetics, hypnotics, anodynes, sedatives, cerebral stimulants, stomachics and digestives, emetics, cathartics, tonics, alteratives, sialagogues and anti-sialagogues, diaphoretics, diuretics, uric acid solvents, antipyretics, organo-therapy, and serum therapy.

Part III of the work deals with Physical Therapeutics, including artificial hyperemia, massage, light and radio-therapeutics, heat and cold, and plugging bone cavities with inert or medicated substances.

Part IV is devoted to Local Anesthesia, its history, means of producing local anesthesia, physiologic action of anesthetics, the hypodermic armamentarium, and the technique of injection.

A valuable Appendix is added, dealing with diagnosis of diseases of the pulp

by the electric current, urine analysis, and treatment of acute poisoning, also a glossary of therapeutic terms and a dose table.

The work is a thorough scientific exposition of the subject of which it treats, a most valuable addition to our literature, and one which will be of undoubted aid not only to the student but to the teacher of dental materia medica and therapeutics.

The volume is remarkably free from textual errors, so often and so inseparably connected with a first edition. As the author in the course of time is able to profit by the criticisms of his fellow teachers developed from the practical use of the book, it will undoubtedly tend to improve subsequent editions.

We confidently recommend the work to the careful and sympathetic study of all who are interested in this important branch of the dental curriculum.

BAU UND ENTWICKELUNG DER MUNDHOEHLE DES MENSCHEN UNTER BERUECKSICHTIGUNG DER VERGLEICHENDEN ANATOMIE DES GEBISSES UND MIT EINSCHLUSS DER SPEZIELLEN MIKROSKOPISCHEN TECHNIK. Lehrbuch fuer Zahnaerzte, Aerzte, und Studierende. [STRUCTURE AND DEVELOPMENT OF THE ORAL CAVITY IN MAN.] By Dr. GUIDO FISCHER, University of Greifswald. Pp. 436, with 340 illustrations and 18 plates. Leipzig, 1909: Dr. Werner Klinkhardt. Price *M.* 17.30.

One experiences a sensation of inadequacy at the task of reviewing such a comprehensive work within the limited space allotted, but at the same time one of pride at the wonderful advancement of dentistry as manifested in this book. Dedicated to the memory of W. D. Miller, this book represents a classic example of German scholarship, comprising everything that is known and worthy of knowing in the field of anatomy, histogenesis, and histology of the oral cavity and the teeth. The method of condensation and the clear and concise representation of the subject saves the reader the trouble of searching through the widely distributed literature, and makes us richer by a most valuable and comprehensive reference book. The text is arranged in the form of lectures, as appears from the address at the head of every chapter and of many paragraphs: "M. H.:" [Meine Herrn—Gentlemen], which in a subsequent edition might well be omitted.

The first part treats of the structure of the oral cavity in general, the muscles, the tongue and glands, and the osseous frame, followed by a lecture on the special anatomy of the human teeth and the nature of normal occlusion. Attention is given to the special topography of the alveolar process, the antrum, and the mandibular canal, together with the relationship of the roots of the teeth to these, also the region of the mandibular foramen, so important in mandibular anesthesia. No less important is the lecture on the architecture of the jaws and its significance in orthodontia. One of Fischer's specialties is the alterations of the pulp chamber and the root-canals during life, the branching of the pulp fibers in the roots of different teeth, which are of such vital importance for a rational treatment of diseased pulps. These chapters especially are profusely illustrated with celluloid casts of pulp chambers and canals, and sectional grindings of the teeth. The first part is concluded with two well-illustrated chapters

on the lymph, blood, and nerve supply of the jaws and soft tissues, and some brief remarks on the eruption of the teeth.

The second part, devoted to comparative anatomy, is perhaps the one most open to criticism, for many of the questions of paleontology, phylogeny, and evolution of homologous tooth-forms in man and animals are still much mooted. The student specially interested in these phases will, however, find the author's conception of these subjects well worthy of close scrutiny.

The third and most important part treats of the microscopic anatomy, histogenesis, and histology of the oral cavity and its contents, and contains the bulk of the author's own investigations. Yet, in these chapters also, many statements appear as established doctrine which in reality are still in the state of conjecture. After describing the development of the oral cavity in general, the development of the teeth, the minute structure of the hard tissues composing the tooth, the soft tissues, and their neighboring organs, the processes closely connected with the teeth, and the resorption of the deciduous set, as well as its causes and course, are discussed in detail. Special chapters are devoted to the minute anatomy of the mucosa, the tongue, the tonsils, the lymph nodes, the soft palate, and the salivary glands; finally, the structural changes in the tooth during its functional activity, and the genesis and nature of denticles.

In the fourth part the approved methods of dental microscopy and its technique are described, furnishing a valuable guide to this work as well as a stimulus for every reader to take part in original research work.

By way of criticism, if we may venture any, it might be suggested that, although the illustrative material is profuse, some of the photographic reproductions might be still further illuminated by diagrammatic drawings of the same excellent quality as are already liberally used in the text, the book containing no less than 340 partly colored text illustrations and 18 large colored plates of admirable distinctness. A further elaboration of the subject index would materially add to the utility of the book, and a bibliography would enhance its value to all engaged in this field of original research. R. H. R.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Lancet*, London, November 6, 1909.]

BACTERIOLOGICAL INVESTIGATION ON SOME MODERN MOUTH DISINFECTANTS (FORMAMINT AND PYOCYANASE). By Dr. Eug. Piasecki, Lemberg.

Although the nature of the great majority of infectious diseases which threaten the child of school age is not known, there is no doubt about the bulk of contagion being transmitted through the mouth and nose. This seems to be the case even with the acute exanthemata, where, among other proofs, we see inflammation of mucous membranes precede the cutaneous symptoms. A really effective method of disinfection of the mouth, nose, and pharynx must be, therefore, considered as a most powerful preventive against a whole series of maladies.

Among methods hitherto in use for this purpose the author omitted gargling—in the first place, because it does not affect the pharynx, at least as it is commonly used and as it can be taught to school children; and in the second place, because the very exact investigations of Dr. C. Röse (*Zeitschrift für Hygiene*, 1901, p. 161) have shown that really strong gargles irritate the mucosa too much to be used for hygienic or preventive purposes. Swabbing and douching are said to act very strongly, but, on the other hand, they require too much practice to be greatly employed outside of hospitals. On the contrary, antiseptic lozenges (formamint) seem to be an ideal method from the purely technical point of view. Dr. M. Young (*Lancet*, March 28, 1908, p. 924) has insisted on their merits so exhaustively that there is nothing to be added. The process of spraying mentioned above presents several well-marked advantages, two of which are that it requires no special training and covers very accurately the whole surface of both mouth and pharynx.

The present investigation was undertaken in consequence of a severe epidemic of scarlet fever in the city of Lemberg, Austrian Poland, in 1908, the inquiry being limited to two newly introduced methods, namely, antiseptic lozenges (formamint*), and antiseptic spray (pyocyanase†). The following conclusions were reached as to the efficiency of these two antiseptics:

Formaldehyd in certain concentrations develops in smears a strongly bactericidal action on the flora of the saliva of healthy individuals. In concentrations, however, that can be considered as nearest to natural conditions, employing formamint tablet-sucking, its action is weak. Investigations carried out in the living subject give similar results. In the first place, after a large single dose of formamint (two tablets), there is a transitory bactericidal action, followed by a considerably augmented growth of bacteria in the cavity of the mouth. In the second place, with smaller, frequently repeated doses (single tablets at one and one-half hours' interval), the growth of bacteria is no doubt lessened, but only to an extent to which hardly any practical value can be attributed. Pyocyanase sprayed into the cavity of the mouth in a large single dose may sometimes, after a transitory period of bactericidal action, cause increased growth of microbes. When sprayed in smaller repeated doses, pyocyanase develops a higher bactericidal action than any other mouth disinfectant which has hitherto been recommended after exact investigation. Before we can recommend pyocyanase, however, for daily use by healthy persons, more extensive investigations are indispensable. Such a recommendation must be withheld until the perfect innocuity of this liquid for the mucous membrane of the mouth is proved. Circumstances have unfortunately prevented the author from carrying out such investigations.

* Formamint is a new chemical compound, its dissolution in the mouth liberating nascent formaldehyd, in which condition the drug exerts its most potent action. [See present issue of Cosmos, page 248.]

† See Cosmos for November 1909, p. 1344.

(I.)

[*Journal of the American Medical Association*, Chicago, December 11, 1909.]

SEVENTY-FIVE CASES OF TRIFACIAL NEURALGIA TREATED BY DEEP INJECTIONS OF ALCOHOL. By Dr. H. T. Patrick, Chicago.

(II.)

[*Ugeskrift for Laeger*, Copenhagen, September 9, 1909.]

TREATMENT OF TRIGEMINAL NEURALGIA. By Dr. T. Levison.

Two years ago, and once since, Dr. Patrick has reported his experiences with deep injections of alcohol, which method was then new and scarcely known in this country. By trifacial neuralgia is meant neuralgia of one or more branches of the fifth or trifacial nerve, tic douloureux. That the patients with this malady suffer horribly is known to all, and that a treatment which is effective and devoid of danger is of great consideration needs no emphasis. While the deep injection method is by no means ideal, it is relatively simple; it is certainly effective in relieving the pain, and is practically free from serious danger.

These injections are made with a straight needle about 10 cm. long, 1.5 mm. thick, and fitted with a stylet or obturator, the blunt end of which is flush with the needle-point. The sharp point is used to puncture the skin,

after which the stylet is pushed home, making a blunt instrument for the remainder of the penetration. The needle is introduced at the lower border of the zygoma, the object being to reach the inferior maxillary division of the nerve at its emergence from the foramen ovale (about 4 cm. deep), and the superior maxillary as it leaves the foramen rotundum (about 5 cm. deep). Deep injections for the supraorbital branch have been abandoned by the author as being too hazardous. When an injection of this branch is needed, which is not very often, he uses a "peripheral" injection at the supraorbital notch. In a few cases a peripheral injection at the infraorbital foramen has been used.

The solution used is about 85 per cent. alcohol (not absolute) with four grains of cocain to the fluidounce. Of this, about 2 ccm. are introduced each time. Morphin and chloroform, formerly used in the solution, have been abandoned, as has also 75 per cent. alcohol for the first injection.

The author's paper constitutes a very brief but accurate report of each case, all of them being unmistakable ones of tic douloureux. Some of them were frightfully severe, most of the patients being quite disabled by the disease. All had tried other forms of treatment, and a considerable number had undergone cutting operations. Some were very old and feeble, yet in no instance was this treatment desisted from on account of the severity of the case or of organic complications.

There can be no doubt that when the injection reaches the nerve, the pain is stopped at once. The greatest drawback to this method is the uncertainty of reaching the nerve on any given trial. But if the patient is willing to persevere, he is practically certain of relief. In many cases, of course, the operator succeeds the first time. The danger of the operation is as nearly *nil* as can well be, no fatality having been recorded nor experienced by the author in over 300 injections. Disagreeable complications are exceedingly infrequent. In a few cases, injection of the middle branch has caused a small hematoma, which did no harm, and occasionally transient paresis of the sixth nerve has been produced. In this connection it is worthy of note that in the 75 consecutive cases covered by this report, 36 patients were between sixty and seventy years old, 13 between seventy and eighty, and one over eighty. The procedure is not excessively painful—at least patients do not often complain of it. In four cases gas was administered, but in only one of these was it absolutely necessary. There is no shock, and the injections are administered at the operator's office. After a few minutes the patients are ready to walk out, though it is preferable to have them lie down for from twenty to thirty minutes. The alcohol itself causes no pain after a few seconds.

There is no reason to believe that these injections effect a radical cure, though this may occasionally be the result. The period of relief to be attained is hard to estimate. A good injection, as shown by marked analgesia, may be expected to relieve for from one to three years, possibly more. Generally the patient neglects to have more treatments after the pain has been stopped, in this way reducing the efficiency. Reinjections after recurrence and injections in cases in which patients have already undergone peripheral operations seem to be just as successful as primary injections, the author, however, not having had occasion to administer an injection to a patient who had been subjected to the ganglion operation.

While no special plea is made for this treatment, it seems, in the majority of cases, the simplest, least hazardous, and best. Should it finally fail, the Abbé or the Gasserian operation is still open to the patient. It will occur to everyone that by this means old, feeble, and infirm sufferers may be made comfortable at minimum risk, until old age or intercurrent disease leads to the final exodus.

This method is also recommended by Dr. T. Levison in treatment of neuralgia rebellious to drugs and physical measures. In malignant form of trigeminal neuralgia, which is rebellious to the salicylates, the pain does not radiate as in the mild form, and there is no local tenderness. It is liable to be brought about by movement of the facial muscles, laughing, sneezing, etc., and in order to avoid this, the patient is inclined to hold his features still, which imparts a characteristic expression. Levison ranks aconite highest after the salicylates in drug treatment, and has had good results in some patients

with this type of neuralgia, the patients taking from one to four pills of aconite three times a day. In four cases the neuralgia was over ten and in the others from one to three years' standing. In three cases the effect of the aconite was marked; another patient was benefited more by potassium iodid. The author refers in particular to Vitek's method of treating the neuralgia with a weak electric current, one anode being held in the mouth to act on the second and third branches, the other under the upper eyelid to act on the first branch. In some of Levison's patients, the neuralgia had returned after gasserectomy.

[*Geo. Poulson's Bericht ueber Neuheiten und Praktische Erfindungen auf dem Gebiete der Zahnheilkunde und Zahntechnik*, Hamburg, October 1909.]

SIMPLIFIED GOLD FILLINGS. By Dr. Arthur Scheuer.

Despite the growing popularity of cast gold inlays, many operators still prefer a malleted filling in some cavities. Take, for instance, a cavity in the crown of a molar. The cavity is simply cleaned out perfectly, without much attention being paid to retentive form; only the margins of the cavity are ground blunt with suitable stones so that there is no undercut, no sharp edge, or sharp angle. A piece of No. 40 gold foil corresponding to the size of the cavity, after having been swaged to fit the general shape of the latter, is pressed with cotton or amadou against the walls and the fundus of the cavity, and carefully burnished against them with ball-shaped burnishers. The portion covering the margins and the excess, which should fold over about one-half millimeter, are treated in the same way. If the finished matrix is easily removable, the excess is carefully cut away, the matrix is replaced and is again burnished against the margins. If the removal of the matrix should present difficulties, the matrix is left in the cavity and the margin is carefully marked. The next operation is to fix the exactly fitting gold matrix. If the foil has been torn in polishing, it is left in the cavity, as is also the excess protruding over the outer margins of the cavity. If the matrix has remained whole, it is cut with a straight excavator at the fundus of the cavity, and the portions covering that fundus are folded over against the walls and burnished against them. The wide tube which then invests the cavity walls is fixed with slowly hardening tin cement, with which about two-thirds of the cavity are filled, and which is carefully condensed with flattened ball burnishers and pluggers so as to not soil the cavity margins with particles of cement. In deep cavities the tin cement serves as a pulp protection, and it adheres so firmly that the subsequent gold filling will be perfect. Tin cement is preferable to ordinary cement, as it enters into close mechanical combination with the gold of the matrix as well as with the dentin of the fundus of the cavity and the layer of unannealed crystal gold, which is laid on the surface of the hardening tin cement and condensed. Another layer of annealed crystal gold is then built up, and the filling is finished with annealed gold cylinders. The excess of the original matrix can either be worked into the filling or ground off when the final touches are put on the filling. The final third of the filling may also be built up with annealed crystal gold until close to the edges, and the surface finished with annealed gold foil. The method suggested affords a considerable saving of time.

[*Journal Odontologique de France*, Paris, September 1909.]

AN ORIGINAL METHOD FOR CASTING GOLD INLAYS. By M. Sadrin, Paris.

That human inventiveness has not yet exhausted itself in regard to new devices for casting machines, incredible as this may seem, is proved by the following suggested device, which in its simplicity resembles the famous egg trick of Columbus, and which will appeal especially to men who are addicted to the pipe. A clay pipe is the whole apparatus, with the aid of which the author, a student of the Dental School of Paris, casts his inlays "in a whiff."

The method suggested is as follows: The wax model is mounted on a sharply pointed sprue wire of 7 or 8 cm. in length. A ball of asbestos fiber of the size of the tip of the little finger is stuffed into a clay pipe. The bowl is then filled about half full with investment material, the wax model is placed in the middle of the pipe on this first layer of investment, held there by means of the long sprue wire, and the rest of the pipe is filled

up with investment material. An excess of the investment is molded over the edge of the bowl to prevent any air from passing between the investment and the wall of the bowl. A little crater-like opening is cut into the investment around the sprue wire by means of a spatula, and before the investment has hardened entirely, the sprue wire is pushed through the wax model and the lower investment layer down to the asbestos fiber, and then withdrawn, in that way securing a passage from the crater to the stem of the pipe. After the investment has been dried, and the wax burned out with a Bunsen burner or an alcohol lamp, the molten metal is poured into the crater, and one aspiration through the stem will suffice to draw the metal up to the asbestos fiber and into the cavity left by the burned-out wax model. After the metal inlay has cooled, it will simply be necessary to cut off two sprues instead of the one that is present in inlays cast with other casting machines.

The aspiration through the stem also constitutes a good test as to whether any of the wax has not been completely burned out. As long as any fumes can be drawn through the stem, particles of wax still remain unburned.

To fastidious smokers who do not care to inhale metal or wax fumes, we would recommend to attach a small bicycle pump by means of a small rubber hose to the stem of the pipe, whereby stronger suction could be secured, and the possibly unpleasant features of the author's method would be eliminated.

[*Le Journal Dentaire Belge*, Brussels, November 1909.]

PERHYDROL IN DENTAL THERAPEUTICS. By Dr. L. Cerf.

Perhydrol (Merck) is a concentrated solution containing in 100 parts by weight 30 parts by weight of absolute hydrogen dioxid. As it contains an enormous quantity of oxygen, *i.e.* 100 times its volume, it is a powerful disinfectant, which when brought in contact with organic matter separates to form water and gaseous oxygen. The oxygen enters into chemical combination with this organic matter and destroys it, without producing any irritation. When introduced into root-canals it effervesces, tearing off all putrid matter, pulp débris, etc., which are seen to float on top of the effervescent liquid. As perhydrol contains no trace of acid, like the commercial oxygenated water, it is absolutely non-irritant and allays post-operative pain, stimulating rapid cicatrization. In discolored teeth the dentinal tubules of which have been penetrated by infectious matter, perhydrol enters into the tubules by capillary attraction, destroys the products of decomposition, and restores the tooth to its normal color. In hemorrhage after extraction, perhydrol proves to be a powerful hemostatic, at the same time disinfecting the lacerated area and stimulating rapid cicatrization. In a case of necrosis of the mandible, in which a 1 : 9 aqueous solution of perhydrol was repeatedly injected into the fistulous tracts, the further spread of the necrosis of the alveolar ridges was arrested, and an elimination of the already necrosed portions in the form of sequestra, with rapid healing, was brought about.

Perhydrol permits of easy manipulation, and enables the operator to make a fresh solution of any desired strength in each individual case.

[*Bulletin du Syndicat des Chirurgiens-Dentistes*, Paris, October 1909.]

OPERATIVE INJURIES IN THE EXTRACTION OF THIRD MOLARS. By Dr. M. R. Manteau.

Owing to its anatomic situation, the third molar offers the greatest difficulties in extracting, and gives rise to peculiar injuries. In the maxilla, which at that portion consists of spongiose osseous tissue covered by a very thin layer of compact tissue, the third molar is implanted very near the maxillary tuberosity; in the mandible it is situated almost in contact with the ascending branch and sometimes even in the angle formed by the reunion of the body and the osseous branches, sometimes even in the ascending branch itself. The injuries to be discussed refer only to the environment of the tooth, not to fractures of the tooth itself. In the maxilla, the extraction is often accompanied by a tearing of the gingivæ, in the mandible also by a laceration of the attachments of the soft palate. Very frequently fractures occur of the alveolar border, or of a partition or a plate, generally an outer one, of the alveolar process. In the maxilla, under the pressure of luxation, fractures of the

maxillary bone in the region of the tuberosity occur which are of a rather serious nature. The great quantity of spongiose and the small amount of compact osseous tissue in this region explain fractures of this sort. Approximating teeth that are frail, loose, or carious often fracture, if used indiscreetly as points of leverage for the forceps. Injuries of the nerves of the maxillary bones and the corresponding arteries and veins always take place simultaneously when the maxillary bones are seriously fractured. They generally heal up with the fracture itself.

For treatment of all these injuries frequent and careful antiseptic rinsing of the mouth with oxygenated water or one of the following solutions is indicated: Naphthol B, 5 grams; alcohol 90 per cent., one tablespoonful in a glass of boiled tepid water. Or: Hydrate of chloral, 10 grams; rose-water, 500 grams; distilled water, 500 grams.

In injuries of the mucous membrane, antisepsis will be sufficient to bring about a cure. In simple fractures of the alveolar borders no intervention is necessary; in partial or complete fractures of the body of the bone, however, readjustment of the fractured portions and immobilization by ligatures or some splint are imperative. Besides rigorous antisepsis, doses of quinin should be administered in order to combat the fever which generally attends such injuries.

[*Zahnaerztliche Rundschau*, Berlin, November 14, 1909.]

DISINFECTION OF THE ORAL CAVITY WITH FORMAMINT. By Dr. Fraenkel, Berlin.

In oral and dental prophylaxis certain definite principles are to be considered. The task of disinfection is to influence antiseptically the bacterial flora of the mouth. Absolute sterility cannot, and should not, of course, be attained, but the total quantity of bacteria is to be controlled, and the pathogenic bacteria are to be sufficiently eradicated. The control of the quantity of the bacteria is brought about even by simple mechanical cleaning of the teeth and by mastication. The pathogenic bacteria, on the other hand, must be eliminated by antiseptics. This is, however, not easily attained, as very few people are at leisure to apply disinfectant mouth-washes at relatively short intervals. The successful application of small quantities of formaldehyd in modern therapeutics has stimulated efforts toward finding formaldehyd compounds suitable for the oral cavity. Formaldehyd, the aqueous solution of which is dispensed under the name of formalin, has a very strongly escharotic effect upon the mucosa. In combining formaldehyd with carbohydrates it was found that these combinations in a dry state have no odor whatever, but give off formaldehyd when moistened with saliva. On this observation formamint is based, which contains formaldehyd absorbed in lactose and is dispensed in the form of tablets flavored with citric acid. These tablets weigh one gram, and contain 0.01 formaldehyd. While dissolving they give off formaldehyd; moreover, by increasing salivation, they exert a lasting effect on the bacteria. Tests showed that streptococci, tuberculous bacilli, typhoid bacilli, and pneumococci, from saliva specimens cultivated in bouillon, agar, and gelatin, were destroyed by formamint. The convenient form of this effective antiseptic has been quickly recognized by the medical profession, and for disinfecting the mucous portions of the mouth it seems very suitable for dentists. Especially in cases of marginal gingivitis, mercurial stomatitis, and fetid breath, when a permanent disinfection of the mouth is desirable, formamint tablets can be conveniently taken by patients at intervals of from one-half to one hour. Extraction wounds can be protected against infection, and in cases of after-pain formamint has been observed to give excellent relief, also in inflammations of the mucosa and the throat due to excessive smoking.

PERISCOPE.

Replacing a Broken Crown or Bridge Tooth.—In case a crown or bridge tooth is broken, it is only necessary to take another tooth of the same mold, grind the groove to the depth of the depressions at the ends, and cement to place.—G. NORTH, *Dental Summary.*

Polishing Metals.—Make a paste of 30 grams of ammonium carbonate dissolved in 120 grams of water and 480 grams of fine chalk. Spread this paste over the surface of the object to be polished and rub with a soft flannel cloth first, then with a piece of chamois skin. If the metal surface has any pits or fissures, a brush may be employed.—*Revue Trimestrielle Belge de Stomatologie.*

Fitting Inlays to Place.—When from any cause an inlay does not fit, its cavo-surface is coated with a mixture of carborundum (180 mesh) in glycerin, the inlay held lightly in position with the fingers, while with a convenient plugger point in the mechanical or electric mallet, blows are so directed that the jarring of the inlay in the cavity grinds a perfect joint.—W. H. T. COLLINS, *Garretsonian.*

To Harden Plaster.—To six parts of plaster one part of freshly slaked and well-sifted lime is added. When the model is dry, it is saturated for two hours with a concentrated solution of zinc sulfate or iron sulfate. A model saturated with zinc sulfate remains white, while iron sulfate imparts to the model a greenish coloration which afterward becomes blackish.—*Deutsche Zahnaerztliche Wochenschrift.*

Oral Sepsis and Tetanus.—At an inquest on the body of a woman who died from tetanus at Southwark, it was given in medical evidence that the teeth were in a very bad state and the septic condition of the mouth might have been responsible for the entrance of the infection. There was a slight wound on the toe, but this had occurred within three days of the onset of symptoms, and was therefore probably not responsible for the disease. Dr. F. J. Waldo, the coroner, took the occasion to warn the public on the dangers of neglecting the proper care of the teeth.—*Lancet.*

Crowns or Bridges Without Casting Against the Porcelain.—In case the construction of a crown or bridge is desired without casting against the porcelain, a tooth is to be used having a deeper groove with no depression at the ends. This is waxed up, the teeth are removed, the wax form is invested and cast, and the teeth are then cemented to place. This will make a piece of work which shows no metal anywhere and will have the merit of being much stronger than any detachable tooth now in use, and yet one as easily replaced as any of them.—R. D. ROBINSON, *Pacific Dental Gazette.*

Dressing After Removal of the Maxilla.—LaRoque mentions a dressing which he employs after removal of the maxilla and as a substitute for a dental plate while the latter is being made, thus allowing the patient to take sufficient food and to speak distinctly. The dressing consists of an ordinary gauze strip, about one inch wide and twelve inches long. About six inches of this strip are placed in hot paraffin so that the meshes will be impregnated by this substance. The paraffin is then allowed to cool, and the other end of the strip is lightly packed into the wound, while the paraffin end is so molded as to form a sort of hard palate.—*Old Dominion Journ. of Med. and Surg.,* per *Journ. Amer. Med. Association.*

Temporary Relief of Toothache.—Waxes and liquids for introduction into carious cavities for the temporary relief of toothache are numerous, but the following formula is novel:

℞—Menthol,	gr. xxx;
Pellitory root,	gr. xxx;
Gum guaiac,	gr. xxx;
Yellow beeswax,	ʒj;
Eugenol,	gtt. x;
Coffee extract,	gtt. x.

Mix and make a mass to be divided into pellets weighing about half a grain each, which are then coated with pulverized cloves, and introduced into the aching cavity.—*Journ. de Méd. de Paris,* per *New York Med. Journal.*

To Tighten a Vulcanizer.—Ordinary newspaper is boiled for from five to ten minutes until it has become quite soft, and is pressed in this condition into the groove of the lid on the old leaky ring. The lid is then screwed on tightly. After the vulcanizer is used once, this paper mass is quite hard and tightens perfectly. Any excess of paper mass is cut off.—*Deutsche Zahnaerztliche Wochenschrift.*

Gutta-percha as an Insoluble Seal for Margins of Inlays.—To form an insoluble seal at the margins of an inlay, the cavo-surface is coated with eucalyptol, a fine roll of base-plate gutta-percha is warmed and formed around the margin of the inlay, heated, and pressed to place in the wet cavity. The excess of gutta-percha is removed, the parts are dried and the inlay is set with cement. As the cement between the gutta-percha and the cavity margins washes out, the gutta-percha expands and an insoluble seal is formed.—W. H. T. Collins, *Garretsonian.*

Rubber Dam in Difficult Cases.—When the cavity is near the gum margin on the labial and buccal surfaces of the teeth, it is often difficult to apply the rubber dam so as to keep the cavity dry. Apply the rubber dam and secure it with ligatures down close to the gum margin of the tooth; then press both rubber and ligature down so as to expose all parts of the cavity, and hold it there until you dry the tooth with hot air; then bathe the tooth with alcohol, and when the alcohol has evaporated, the rubber will generally remain in place and the cavity can be filled without danger of moisture.—G. North, *Dental Summary.*

Importance of Preservation of the Pulp.—It is impossible to overestimate the importance of the pulp to the continual life of the tooth, and the operator who sacrifices this for a temporary gain assumes responsibilities of very serious character, and this has become of frequent occurrence, so frequent that the average practitioner has ceased to regard this central organ as being of any moment.

The pulp destroyed pathologically or by artificial methods forces the dentist to means of repair. This is accomplished by well-known methods. The result in the anterior teeth is generally satisfactory, the teeth remaining useful for an indefinite period. This is only partially true of the posterior teeth. Here complications arise in the roots, which are difficult to fill, and this combined with stress of mastication upon weak enamel, and with the loss of the organic matrix, leaves the occlusal surface in connection with the filling liable to crack, and the filling is exposed to the re-establishment of caries. Therefore posterior teeth with lost pulps are rarely lasting.

The loss of the pulp should be seriously considered by crown and bridge workers. The stability of these fixtures will largely depend on wise judgment in the selection of abutments in bridge work, and possible pathological lesions in crowning must not be disregarded.

The following considerations should always be kept in mind when the life of a dental pulp is at stake:

(1) That the pulp is essential to the life of the dentin and enamel.

(2) That the death of the pulp, however produced, means loss of strength in the dentin and eventual disintegration of the enamel.

(3) That the loss of the pulp forces the peridental membrane to become the whole support of the tooth, and this extra duty eventually ends in its death, the tooth becoming a foreign body.—J. Truman, *Penn Dental Journal.*

Pain After Extraction.—In almost every list of dental hints or digests or advertisements of a drug appears a method of treating pain after extraction. It might be well to consider the probable cause of pain after extraction, and then apply the remedy most suitable for the condition. Pain which immediately follows the removal of a tooth about the root of which there has been a severe inflammation is said to be due to the stretching and disturbance of nerves which have been previously subjected to great pressure in the bony walls of the root-socket. A similar pain occurs when a severely inflamed pulp has been opened. In such cases the pain will shortly subside without treatment, even in five or ten minutes. In this condition an anesthetic is required, such as campho phénique, phenol and cloves, phénol sodique, or perhaps cocain solution.

In all ordinary cases there should be no other pain than that which follows immediately after the removal of such a tooth. Pain which comes on some hours after extraction is due to a renewal of the infection, which should have been prevented at the extraction. Too many dentists feel that all their duty to their patient has been performed when they extract a tooth about which there is a severe infection. To neglect to thoroughly wash out and cleanse the socket of such a tooth and pack with a disinfectant places the dentist at a great disadvantage before the patient,

his *confrères*, or a court of law. Many such cases have come before the courts under the charge of using unclean instruments, when perhaps nothing could be farther from the fact. Even though the socket is thoroughly washed out and disinfected, it does not follow that the infection will cease, but in the great majority of cases there will be no further trouble.

The pain coming on some hours or days after the extraction should be first attacked locally by opening up the cavity and thoroughly washing and packing with antiseptic dressings, which should be removed and renewed frequently. The pain may be relieved with local anesthetics and warm applications. The general treatment should be tonic and supporting.—Editorial, *Dominion Dental Journal.*

Galvano-cautery for Sterilizing Root-canals.—As the platinum wire which is to be introduced into the root-canal must be very thin, the loop is easily bent, and difficult to introduce into narrow canals. The wires either cross or touch near the point of introduction. Thus the end of the cautery is not brought to a glowing heat. To avoid these drawbacks, a cautery point may be constructed as follows: An annealed platinum wire of 0.3 mm. diameter and about 15 cm. length is folded in the middle, the double wire end is hammered out to a point, to which the necessary rigidity is imparted by soldering the two wires with pure gold. The wire loop, with the soldered point first, is then drawn through a corresponding hole in the drawplate, imparting to it the necessary smoothness. The wires are then separated by forcing a fine steel sheet between them so that they touch only at the point. The slot between the two wires is filled to a length of from 1½ to 2 cm. with thickly mixed Ash's enamel, and fused together in the furnace. In this way a fine, rigid, and insulated cautery point is obtained, which begins to glow first at its extreme end, which is of great advantage. In glowing, the point becomes soft so that it can be introduced into tortuous canals. This point is, of course, rather delicate and requires very careful handling, as, otherwise, in bending the point some enamel might break off.—Leo Scheller, *Zahnaerztliche Rundschau.*

Nervousness and Insanity Caused by Painless Dental Disease.—Of all cases of neurasthenia and psychoses not due to obvious physical causes, such as digestive disorders and eye-strain, the great majority, possibly four-fifths in men and three-fifths in women, are due to dental diseases. The remainder are caused by many obscure visceral conditions. In women nervous and mental affections are often caused by pelvic disease, and this is the reason for the statistical difference between men and women.

In cases in which marked dental lesions are found, and no other serious disease is present, the probability of cure can only be estimated by study of cases treated. The following is a tabulated statement of cases of neurasthenia and psychoses seen in private practice during about two and one-half years, in which skiagraphic examination was made. These results represent the first stumbling efforts in a new and unknown field, and so do not adequately represent what may be accomplished by skill and careful endeavor along the same line:

	Number.	Operation.	Recovery.	Convalescent.	Improved.	Unimproved.	No data.
Mania, depressive	11	9	5	..	2	..	2
Dementia præcox	10	8	5	1	..	2	..
Psychosis	4	4	1	2	..	..	1
Insomnia	7	6	2	..	4	..	..
Neurasthenia	26	15	1	4	6	1	3
	58	42	14	7	12	3	6

Cases of impaction included above:

	Number.	Operation.	Recovery.	Convalescent.	Improved.	Unimproved.	No data.
Mania, depressive	5	3	2	..	1	..	..
Dementia præcox	7	5	4	1	..	..	..
Psychosis	2	2	1	1	..	..	..
Insomnia	3	2	..	..	2	..	..
Neurasthenia	13	9	..	4	2	1	2
	30	21	7	6	5	1	2

In 22 out of 28 patients definite improvement began within a week or two after operation, that is, early in the period of subsidence of irritation.—H. S. Upson, *Dental Summary.*

HINTS, QUERIES, AND COMMENTS.

THE CONTINUOUS GUM DENTURE.

It is surprising how few dentists make use of this form of artificial denture, for it remains today the only ideal denture. In all the nearly sixty years since its introduction there has been nothing to take its place, when properly made, as it is the most durable, the most artistic, and the only clean denture.

The principal objection that has been raised against its use by dentists is its weight. I have simply to say that I do not consider weight a factor in the insertion of an upper denture. In all my experience with this work since 1851, I have never had to replace a continuous gum denture with something lighter. Patients do not complain of the weight. I have often used these dentures without any air-chambers, with perfect success, in flat, ridgeless jaws, where long bites were required for restoration. This would indicate that the weight is a minor consideration. Two years ago I made a set for a lady of eighty years of age, who was wearing a set which I had made for her forty-five years before. She would have nothing else, although at her age some other plate would have answered the purpose.

There is one class of cases in which no other appliance will be so completely satisfactory, *i.e.* cases of short upper lip and prominent jaw, in which very thin, high, and seamless porcelain gums are required. In such dentures the gum is strong, no matter how thin it may be, because it is baked to the plate. I have had many cases of this description which absolutely defy scrutiny and are of great durability. I never expect such a denture to last less than twenty years, and have seen scores that have been worn twenty-five, thirty, and more years. The strength of these dentures lies in the metal. The metal foundation must be strong. Too often thin platinum is used, while never thinner than No. 28 gage should be employed, reinforced across the heel, and wired with a flat platinum wire soldered edgewise. The necessity for backings, especially of the anterior portion, is too often overlooked. Backings are fitted from patterns previously made, with foot-piece one-eighth inch wide, beneath which pure gold, very thin, is placed, and the pins are turned down with gold beneath them. These backings are fitted in three sections, overlapping at the canines.

More of this work is made by dentists in Chicago than elsewhere. A Boston patient told me that she had been unable to find a dentist in that city who was familiar with this work—more than to say that the weight was objectionable.

I purchased an office license from Dr. John Allen's agent in the year 1851 for $150. Twelve others purchased similar licenses, but abandoned the work within a year. The reason for this was the faulty instructions which they had received from the agent—failure from which I had predicted, as I had been making carved block teeth for six years, and therefore was familiar with porcelain.

L. P. Haskell.

Chicago, Ill.

A PRACTICAL METHOD OF THERMO-CAUTERY.

Dry the part to be cauterized and apply to it the blast of a hot syringe. This method has the advantage that as the instrument is kept at a distance, no bleeding is provoked owing to the adherence of mucus. The operation does not frighten the patient as does the introduction of red-hot instruments into the mouth.

Ruy Whittlesey Tebyricá.

Joinville, Santa Catharina, Brazil, S. A.

OBITUARY.

DR. MARY REBECCA RAUCH CORNISH.

Died, at her home, Collegeville, Pa., August 5, 1909, Mary Rebecca Rauch Cornish, D.D.S., wife of Dr. Samuel D. Cornish.

Dr. Cornish, a daughter of the late Dr. George L. and Mrs. S. R. Rauch, and a sister of the late Dr. Louis E. Rauch, was born in Philadelphia, February 12, 1875. She was graduated from the Pennsylvania College of Dental Surgery in the class of 1896, and was a member of the C. N. Peirce Society and of the Woman's Dental Association. She practiced her profession until a short time before her death, when failing health made it necessary for her to retire. She was devoted to her profession and kept in touch with all that made for its advancement.

This is the second death in the association in less than two years—the first being that of one of our charter members, Dr. Elizabeth Davis McDonald, who, like Dr. Cornish, was a faithful officer and member, and ready to do all she could to further the welfare of the society.

In the death of these two members the society has sustained a loss that will long be felt. With perfect resignation they heard the call of the Master to a peaceful rest after months of suffering.

Dr. Cornish's husband and mother enjoy the sweet consolation that they brought to her life all the happiness that love could bestow, and the members of the association sympathize deeply with them in their bereavement.

H. Belle Whitcomb.

Brief Necrology.

Dr. Frederick W. Smith of Binghamton, N. Y., December 21, 1909.

Dr. Frank Green of Gillespie, Ill., December 10, 1909, in his fifty-fifth year.

Dr. Andrew J. Harris of Chicago, Ill., December 16, 1909, in his seventy-ninth year.

Dr. U. C. Nall of Princeton, Ky., December 10, 1909, in his thirtieth year, of typhoid fever.

Dr. T. A. Lowry of Benton Harbor, Mich., December 19, 1909, in his fifty-seventh year, of heart disease.

Dr. John W. Geisinger of Johnstown, Pa., December 4, 1909, in his fifty-seventh year, of uremic poisoning.

Dr. John Wymann of Brooklyn, N. Y., November 30, 1909, in his sixty-sixth year, of morphin poisoning.

Dr. Alfred A. Argilagos of New York, N. Y., November 26, 1909, in his forty-second year, of kidney trouble.

Dr. John C. Houck of Addison, N. Y., December 31, 1909, in his fifty-second year, of pulmonary hemorrhage.

Dr. J. H. Mathers of Forty Fort, Pa., December 8, 1909, from burns sustained by an explosion of gasolene in his laboratory.

Dr. G. D. Billings of Medina, Ohio, October 7, 1909, in his sixty-eighth year, of heart failure. The deceased was a civil war veteran.

Dr. A. R. Vallee of Dodgeville, Wis., December 23, 1909, in his fifty-fifth year, as the result of taking a (supposed) dose of medicine from the wrong bottle.

Dr. William M. Limber of Pittsburg, Pa., December 10, 1909, in his forty-second year, of heart disease. The deceased was a graduate of the dental school of the Western University of Pennsylvania.

Dr. Craven T. Osburn of Columbus, Ga., November 1, 1909, of Bright's disease. The deceased was at one time president of the Georgia Dental Society, and was a member of the Columbus Society of Dental Surgeons.

Dr. J. D. Moody of Los Angeles, Cal., November 26, 1909, in his sixty-eighth year. The deceased was a civil war veteran, and served as private secretary to General Gar-

field. He was at one time president of the Southern California Dental Association, also lecturer in the dental department of the University of Southern California; a member of the Southern California Historical Society and the Southern California Academy of Sciences. He was prominent in educational and church circles.

SOCIETY NOTES AND ANNOUNCEMENTS.

AMERICAN CIRCULATING DENTAL CLINIC.

The Cleveland Dental Society has appointed a committee to be known as the American Circulating Dental Clinic, consisting of Drs. G. H. Wilson, W. A. Price, H. L. Ambler, Guy D. Lovett, V. E. Barnes, and S. M. Weaver. The object of said committee was to arrange an interchange of clinics with a given number of cities, probably seven, representing seven sections of the United States. The cities chosen are Cleveland, New York, Philadelphia, Chicago, Kansas City, Los Angeles, and New Orleans. The idea is to have each society appoint a similar committee of six to co-operate with the other cities. Each committee's duty would be to collect, say, ten of the best possible clinics from their districts. Clinics to be composed of new devices, new methods, superior pieces of workmanship, or anything the committee should elect as an educational clinic of sufficient importance.

We want the *new things* brought out, and believe this will be the best way to bring the different sections of the United States in close touch with one another. We realize there are many valuable ideas and appliances lying around dormant and kept from the profession because the originator is not a writer for magazines, or is too busy to take the time to exploit them. An active committee will be able to obtain a great many such, and induce the men to put them in a presentable shape for the American Circulating Dental Clinic.

We are desirous of having the committees appointed at once, so they will have time to provide their display. The idea at present is to have all the clinics shipped to Cleveland first and arranged in a systematic and presentable shape for exhibition; also to arrange the combined clinics in shipping trunks so that they may be forwarded to the next city. Each clinic to have a short typewritten explanation to accompany it, so that any member of the committee to whom it is shipped can examine it and be able to explain it in a few words at time of exhibition.

After the clinics have made the round of the circuit, Cleveland, for instance, would take out her old clinic and put in a new one, and so on around the circuit. This would give each city practically one year to collect the new exhibit. There being seven cities in the circuit, it would take in the winter months, say from October to April, the probable months in which societies hold their meetings. These dates will have to be arranged later to best accommodate all.

We do not want this exchange for convention use, but as a grand show for the city and surrounding territory which it represents. The committees have been chosen from men who are enthusiastic and who frequent conventions in order to meet with progressive men. The committees are appointed in the following manner: Two for three, two, and one years respectively. In this way the oldest members, being familiar with the work, would be of great assistance in keeping up the high standard of clinics which we hope to obtain.

There are more details to be worked out later, and the Cleveland committee will welcome any suggestions from the other committees. The aforesaid cities have been chosen as best representing their sections of the United States, and we hope to receive immediate and encouraging co-operation. If we all work together we can make these meetings the largest exhibitions of progressive dentistry ever seen.

All clinics should be sent to your district chairman, and he in turn will send his combined clinic to Cleveland for the first meeting, so they may be arranged for the trip around

the circuit. We hope every city chosen will put its shoulder to the wheel and try to make its own exhibit the best.

Yours truly,
S. Marshall Weaver,
Central Chairman.

N. B. Send clinics to your district chairmen, keeping models as small and light as practicable. Accompany each with a detailed description as concise as possible.

At a meeting of the Chicago committee on the American Circulating Dental Clinic it was decided, in order to create interest and reach the greatest number of dentists who otherwise might not be asked to clinic, to make the clinic competitive. This will give every man who has a new idea a chance to compete. A letter explaining the clinic in detail should be sent to the district chairman, Dr. D. C. Bacon, 103 State st., Chicago, and the clinic under separate cover with concise explanation accompanying it. Each clinic will be given a number as it arrives, and the committee will select the ten best, after which the names will be attached so that the clinician may receive full credit for his work.

ROTTERDAM DENTAL SOCIETY.

Gnatho-dynamometer Prize Competition.

The Rotterdamsche Tandheelkundige Vereeniging (Rotterdam Dental Society) once more offers a prize of *f.*300 ($120, £25) for the invention of a gnatho-dynamometer suitable for use in dental practice.

The instrument is required to register a pressure up to 150 kilograms. Below 20 kgm. pressure the limit of error must not exceed 1 kgm., while under higher pressure the limit of error should range within 2 kgm. The bite-plates must allow of introduction into an aperture of 1 cm.; if introduction be possible into an aperture of less than 1 cm. it will be regarded as a great advantage. The shape of the bite-plates is to be adaptable to the inclination of the masticatory surfaces. Under a pressure exceeding 20 kgm. the scale must be readily read off, or else calculable very readily. Although expected to register only the pressure in one direction, it should also allow of moderate lateral movement. In the front teeth only the normal incisal bite, not the overbite, should be measurable. The instrument must be simple, strong, and the parts which come in contact with the mouth must be readily sterilizable. The bite-plates should not damage the teeth, and must be so shaped that pressure can be brought to bear upon them at any point between the masticatory surfaces. After the pressure has been read off, the register must be easily readjustable.

Competitors are requested to submit a model of their instrument, postage prepaid, until October 1911, to the Rotterdamsche Tandheelkundige Vereeniging, 93 Aert van Nesstraat, Rotterdam, including a motto and directions for use, and a sealed envelope must be inclosed marked outside with the same motto, and containing the name and address of the inventor.

The jury is composed of the following dentists: B. Frank, A. A. H. Hamer, D.D.S., I. J. E. deVries, Amsterdam; C. H. Witthaus, D.D.S., Rotterdam; besides a technical expert. The decision of the jury will be made public in December 1911.

The result will be announced to all competitors, to whom their models will be returned. The prize will be conferred in January 1912, at the annual meeting of the Rotterdamsche Tandheelkundige Vereeniging.

Dental and technical journals are kindly requested to publish this notice.

M. Isebree Moens, *Sec'y.*

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The twenty-eighth annual session of the National Association of Dental Examiners will be held at the new Savoy Hotel, Denver, Colo., commencing Monday, August 1, 1910, at 10 A.M. The rates will be $2.00 per day for one and $3.00 per day for two persons in room, European plan; large room for one or two with private bath $4.00 and $5.00 per day. Meeting and committee rooms at the service of the association, free, and every accommodation extended.

An early mail reservation is requested, the time being the busy season. A full representation from every state in the United States is earnestly desired.

J. J. Wright, *President,*
Wells bldg., Milwaukee, Wis.
Chas. A. Meeker, *Sec'y,*
29 Fulton st., Newark, N. J.

AMERICAN DENTAL SOCIETY OF EUROPE.

The thirty-seventh annual meeting of the American Dental Society of Europe will be held in Paris, France, on March 25, 26, and 28, 1910, at the Hotel Continental.

A most cordial invitation is extended to members of the profession to be present.

T. G. Patterson, *Hon. Sec'y*,
2 Quai des Eaux-Vives, Geneva, Switzerland.

NATIONAL DENTAL ASSOCIATION—SOUTHERN BRANCH AND THE TEXAS STATE DENTAL ASSOCIATION.

Change of Date of Meeting.

The thirteenth annual meeting of the Southern Branch of the National Dental Association will be held in Houston, Texas, Wednesday, May 4, 1910, continuing in session three days.

The association has accepted the invitation of the Texas State Dental Association to meet conjointly with them and as their guests.

The officers and members are actively at work, and a most instructive program is being arranged. A preliminary program will be announced later.

Carroll H. Frink, *Recording Sec'y*,
301 Masonic Temple, Jacksonville, Fla.

The annual meeting of the Texas State Dental Association will be held at Houston, Texas, May 3, 1910. On May 4, 5, and 6 the association will hold a joint meeting with the Southern Branch of the National Dental Association, at the same place. The profession is cordially invited to visit Texas on this occasion.

J. G. Fife, *Sec'y*,
Dallas, Texas.

G. V. BLACK DENTAL CLUB OF ST. PAUL.

Annual Clinic.

Everybody interested in advanced dentistry is cordially invited to attend the annual clinic of the G. V. Black Dental Club.

The meetings will be held in the Old State Capitol building in St. Paul, on Thursday and Friday, February 24 and 25, 1910. The program was in part published in the January dental journals, and it does not seem necessary to publish it again.

There will be operations of all kinds. A large number of men will hold table clinics. A large number of manufacturers have reserved space, and will be present to demonstrate the new things in dentistry. The profession generally is invited to attend.

For any information address

R. B. Wilson, *Sec'y*,
Amer. Nat'l Bank bldg., St. Paul, Minn.

ABERDEEN (S. D.) DISTRICT DENTAL SOCIETY.

Midwinter Clinic.

The Aberdeen District Dental Society will hold its annual midwinter clinic at Aberdeen, S. D., March 23 and 24, 1910. Prominent members of the profession from various sections of the country will be present, and the largest manufacturers' display ever held west of the Twin Cities is being planned. Grand ball and banquet on the evening of the 23d.

Bring your wife. You cannot afford to miss this meeting.

Carl Fossume, *Ch'man of Clinic*,
19 Wells bldg., Aberdeen, S. D.

IOWA STATE DENTAL SOCIETY.

The forty-eighth annual meeting of the Iowa State Dental Society will be held at Des Moines, May 3, 4, and 5, 1910. Besides an especially strong program, plans are being made for a large dental manufacturers' exhibit. Display space free of charge.

W. G. Crandall, *Sec'y*,
Spencer, Iowa.

ILLINOIS STATE DENTAL SOCIETY.

The forty-sixth annual meeting of the Illinois State Dental Society will be held in Springfield, May 17, 18, 19, and 20, 1910.

In addition to an especially good list of essays and clinics, an unusually attractive supply exhibit is being planned.

J. F. F. Waltz, *Sec'y*,
Decatur, Illinois.

LOUISIANA STATE DENTAL SOCIETY.

CHANGE OF DATE OF MEETING.

THE thirty-second annual meeting of the Louisiana State Dental Society will be held at the Grunewald Hotel, in New Orleans, La., May 9, 10, and 11, 1910.

W. C. RICHARDSON, *Sec'y Ex. Com.*

INDIANA STATE DENTAL ASSOCIATION.

THE fifty-second annual meeting of the Indiana State Dental Association will be held in Indianapolis, May 17 to 19, 1910, at the Claypool Hotel. This promises to be a great meeting.

OTTO U. KING, *Sec'y*,
Huntington, Ind.

VERMONT AND NEW HAMPSHIRE DENTAL SOCIETIES.

JOINT MEETING.

THE Vermont and New Hampshire Dental Societies will hold a joint meeting at Rutland, Vt., May 17 to 20, 1910.

HARRY F. HAMILTON, *Sec'y*,
Newport, Vt.

MISSISSIPPI DENTAL ASSOCIATION.

THE seventeenth annual meeting of the Mississippi Dental Association will be held in Jackson, in the Senate chamber of the Capitol, May 24 to 26, 1910. All ethical dentists are invited.

L. B. PRICE, *Sec'y*,
Corinth, Miss.

MASSACHUSETTS DENTAL SOCIETY.

THE Massachusetts Dental Society will hold its forty-sixth annual meeting at Springfield, June 8, 9, and 10, 1910. An attractive program will be presented.

Ethical practitioners of dentistry residing in the state of Massachusetts who may desire to join the society are requested to send their names and addresses to

CHARLES W. RODGERS, *Sec'y*,
165 Harvard st., Dorchester, Mass.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE Pennsylvania State Dental Society will hold its next annual meeting in the Board of Trade Building, 112-116 Market st., Harrisburg, June 28, 29, and 30, 1910.

LUTHER M. WEAVER, *Recording Sec'y*,
Philadelphia, Pa.

VIRGINIA STATE DENTAL ASSOCIATION.

THE forty-first annual session of the Virginia State Dental Association will be held at Staunton, Va., July 20 to 22, 1910.

Every effort is being made to make this the most interesting and successful meeting of our society. Men of national reputation will give clinics and read papers. All ethical practitioners are cordially invited to attend.

W. H. PEARSON, *Corr. Sec'y*,
Hampton, Va.

READING (PA.) DENTAL SOCIETY.

AT the twelfth annual meeting of the Reading (Pa.) Dental Society the following officers were elected to serve for the ensuing year: J. T. Bair, president; G. F. DeLong, vice-president; G. S. Schlegel, secretary, and M. U. Gerhard, treasurer. Dental Dispensary Board—C. V. Kratzer (president), W. H. Scholl, H. W. Bohn, C. R. Scholl, M. U. Gerhard, and G. S. Schlegel (secretary).

GEO. S. SCHLEGEL, *Sec'y*.

NORTHWEST MISSOURI DENTAL CLUB.

MEETING FOR ORGANIZATION.

THE representative dentists of Northwestern Missouri met with the St. Joseph Dental Club on December 15, 1909, at which time the Northwestern Missouri Dental Club was organized with about fifty charter members.

The following officers were elected: Dr. C. L. Larmer, Albany, president; Dr. Wesley Good, St. Joseph, vice-president; Dr. D. Milton Austin, St. Joseph, secretary; Dr. Jesse Miller, Maryville, treasurer, and Dr. B. G. Wenker, St. Joseph, librarian.

Meetings will be held semi-annually, the next one to be with the St. Joseph Club in St. Joseph, at their monthly meeting in March.

ST. LOUIS SOCIETY OF DENTAL SCIENCE.

The St. Louis Society of Dental Science, at the December meeting, elected the following officers: C. O. Simpson, president; G. E. Hourn, vice-president; J. P. Marshall, secretary; C. S. Dunham, treasurer; H. W. Lansberg, curator. Executive Committee—E. P. Dameron, Richard Summa, A. H. Winkelmeyer, W. E. Wilson, and W. B. Arthur. Advisory Council—G. A. Bowman, B. L. Thorpe, A. H. Fuller, D. O. M. LeCron, Adam Flickinger, W. E. Brown, and E. E. Haverstick.

J. P. Marshall, *Sec'y.*

ODONTOLOGICAL SOCIETY OF NEW ORLEANS.

At the annual meeting of the Odontological Society of New Orleans the following named officers were elected to serve for the ensuing year: Dr. J. C. Crimen, president; Dr. E. L. Fortier, vice-president; Dr. St. Clair Duke, secretary and treasurer. Executive Committee—Drs. L. Archinard, H. P. Magruder, and Paul DeVerges.

Suitable resolutions were passed on the death of John J. Archinard, A.M., M.D., honorary member of this society.

St. Clair Duke, *Sec'y,*
New Orleans, La.

ODONTOGRAPHIC SOCIETY OF WEST PHILADELPHIA.

On January 3d the Odontographic Society of West Philadelphia held their first annual meeting. The following officers were elected: L. M. Weaver, president; B. C. Hannington, first vice-president; W. D. McKissick, second vice-president; J. A. McClain, treasurer; R. R. Parks, secretary; J. G. Lane, editor.

Forthcoming Meeting.

The next meeting will be held Monday, February 7th, at 8 p.m., in the amphitheater of Dental Hall, University of Pennsylvania.

Dr. Wilson Zerfing will read a paper on "Oxyphosphate of Copper," the discussion of which will be opened by Dr. A. P. Lee and Dr. F. Amend, Jr.

R. R. Parks, *Sec'y.*

ARMY DENTAL CORPS.

Memorandum of changes of stations and duties of dental surgeons, U. S. army, for the week ending January 1, 1910:

John H. Hess, examining and supervising dental surgeon, relieved from duty at the Army General Hospital, San Francisco, Cal., and ordered to Fort McDowell, Cal., for duty.

Alden Carpenter, from temporary duty at Fort Ethan Allen, Vt., to Fort Hancock, N. J.

S. Davis Boak, relieved from duty at Fort McDowell, Cal., and ordered to the Army General Hospital, San Francisco, Cal., for duty.

George I. Gunckel, granted leave of absence for fifteen days, about January 15, 1910; ordered to Fort Morgan, Ala., about February 1, 1910, for temporary duty.

E. P. R. Ryan and F. L. K. LaFlamme, relieved from duty at Fort D. A. R. Russell, Wyo., and Fort Sheridan, Ill., respectively, and ordered to the Philippine Islands for duty, on transport to sail from San Francisco about March 5, 1910.

For the week ending January 8, 1910:

John R. Ames, relieved from duty at Fort Snelling, Minn., and ordered to the Philippine Islands for duty, on the transport to sail from San Francisco, Cal., about April 5, 1910.

George L. Mason, R. M. Hollingsworth, and F. M. Wing, relieved from duty in the Philippine Islands and directed to proceed on the transport to sail from Manila about March 15, 1910, and upon arrival at San Francisco, Cal., to report by telegraph to the Adjutant-general of the army for further orders.

Charles J. Long, relieved from duty in the Philippine Islands, and directed to proceed on the transport to sail from Manila, about April 15, 1910, and upon arrival at San Francisco, Cal., to report by telegraph to the Adjutant-general of the army for further orders.

For the week ending January 15, 1910:

George E. Stallman, ordered to proceed from Fort Sam Houston, Texas, to Fort Sill, Oklahoma, and to Fort Logan H. Roots, Ark., for temporary duty.

John R. Ames, ordered to proceed on February 1st to Fort Yellowstone, Wyo., for temporary duty.

For the week ending January 22, 1910:

Robert T. Oliver, examining and supervising dental surgeon, is designated to conduct an examination commencing Monday, March 7, 1910, at Ft. Slocum, N. Y., of such applicants for employment as dental surgeons in the army as may be authorized by the Surgeon-general of the army to present themselves for examination.

John H. Hess, examining and supervising dental surgeon, is designated to conduct an examination on March 7, 1910, at Ft. McDowell, Cal., of applicants for employment as dental surgeons in the army.

Robert H. Mills, ordered to proceed from Ft. Adams, R. I., to Watertown Arsenal, Mass., for temporary duty.

John R. Ames, granted twenty-one days' leave of absence.

EXAMINATIONS FOR DENTAL SURGEONS, U. S. ARMY.

AT FORT SLOCUM, N. Y., AND FORT McDOWELL, CAL.

AN examination will be authorized to be held at Fort Slocum, N. Y., and Fort McDowell, Cal., beginning Monday, March 7, 1910, with a view to establishing a list of eligibles from which employment as dental surgeon, U. S. army, will be given as occasion may require, in the order of general average attained by the applicants. The full examination will cover a period of from ten days to two weeks.

Applicants will be authorized to present themselves at the nearest military post at which a commissioned medical officer is stationed, for examination as to physical qualifications for employment as dental surgeon. Any physical defect which would disqualify an applicant for a commission or for enlistment in the army will be sufficient to reject an applicant for dental surgeon.

It must be distinctly understood that all expenses entailed by the journey, for physical examination, and to, from, and while at the place of professional examination, must be borne by the applicant; there are no public funds from which any part of such expenses can be paid.

Application blanks can be procured upon application to the Surgeon-general of the army.

ILLINOIS CIVIL SERVICE COMMISSION.

EXAMINATIONS FOR DENTAL INTERNES, ETC.

EXAMINATIONS will be held for the following positions in the State charitable institutions at 9 A.M. Wednesday, March 30, 1910:

Dental interne. Open to men and women over twenty-one. Scope and weights: Anatomy of the head and neck, dental anatomy, operative dentistry, prosthetic dentistry, dental pathology, oral surgery and oral hygiene, 7; experience, 3.

Pharmacist. Open to regularly licensed pharmacists over twenty-one. Experience, 4; technical questions on pharmacy, 6.

Engineer. Open to men over twenty-three. Experience, 3; mechanical ability, steamfitting and electrical work, 3; boiler-room practice, steam engines and their care, steam heating, 3; English branches, 1.

The above examinations will be held in the following cities: Chicago, Elgin, Kankakee, Watertown, Peoria, Jacksonville, Lincoln, Anna, Aurora, Belleville, Bloomington, Cairo, Canton, Centralia, Clinton, Charleston, Effingham, Galesburg, Golconda, Harrisburg, Macomb, Marion, Mt. Carmel, Mt. Vernon, Olney, Ottawa, Pana, Paris, Paxton, Quincy, Rockford, Sterling, Urbana, Springfield, and Vandalia.

Address requests for applications to the Illinois Civil Service Commission, Springfield. All applications must be filed by March 23d.

JOSEPH C. MASON, *Chief Examiner.*

Springfield, Ill., January 21, 1910.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the Assembly chamber of the State-house at Trenton, N. J., July 5, 6, and 7, 1910. Practical work on the 5th, and the theoretical examination the 6th and 7th. All applications must be in the hands of the secretary ten days prior to the meeting. Applicants must send preliminary credentials and photograph with the application, or it will not be accepted.

Sessions begin promptly at 8 A.M. each day.

CHAS. A. MEEKER, D.D.S., *Sec'y,*
29 Fulton st., Newark, N. J.

MASSACHUSETTS BOARD OF REGISTRATION.

A MEETING of the Masachusetts Board of Registration in Dentistry, for the examination of candidates, will be held in Boston, Mass., March 2, 3, and 4, 1910. Applications may be obtained from

G. F. MITCHELL, *Sec'y*,
Haverhill, Mass.

MINNESOTA BOARD OF EXAMINERS.

THE next regular meeting of the Minnesota State Board of Dental Examiners will be held at the dental department of the State University in Minneapolis on March 15, 16, and 17, 1910.

All applications must be in the hands of the secretary ten days previously. All applicants must be graduates and present their diploma. Those having practiced in any of the following states for five years or more will be exempt from the theoretical examination: Iowa, Indiana, Michigan, Nebraska, Wisconsin, or Montana. Minnesota dentists are admitted to those states on the same conditions.

For blanks and further information apply to

Dr. GEO. S. TODD, *Sec'y*,
Lake City, Minn.

ARIZONA BOARD OF EXAMINERS.

THERE will be a meeting of the Arizona Board of Dental Examiners, April 18 to 21, 1910, at Tucson, Ariz.

Candidates should have in their application, and fee of $25.00 should accompany same, at least twenty days before meeting. Theoretical examination includes the following subjects: Anatomy, physiology, chemistry, materia medica, therapeutics, metallurgy, histology, pathology, operative and mechanical dentistry, oral surgery; practical demonstration of skill in operative and mechanical dentistry will also be required, and candidates should come prepared with instruments and material for making fillings and crowns in the mouth.

W. A. BAKER, *Sec'y*.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING DECEMBER 1909.

December 7.

No. 942,058, to C. H. DEGOWIN. Tooth-brush holder.

No. 942,485, to FRANK CORKINS. Head-rest.

December 14.

No. 942,931, to CARL E. RITCHEY. Dental spittoon.

No. 943,113, to E. J. GREENFIELD. Mounting for artificial teeth.

No. 943,353, to JAMES W. IVORY. Matrix retainer.

No. 943,354, to JAMES W. IVORY. Artificial tooth.

No. 943,361, to CLARENCE MAYER. Mouth-brace.

December 21.

No. 943,884, to WM. B. MILLER. Dental instrument.

No. 944,115, to CHAS. F. TULLY. Dental plugger.

December 28.

No. 944,254, to E. P. BINFORD. Inlay carver.

No. 944,741, to CHAS. J. FINK and D. J. MERRICK. Automatic cut-off for cuspidors.

No. 944,765, to JULES BENGUÉ. Bottle stopper.

No. 944,836, to J. A. WILLIAMS. Artificial tooth.



DR. D. F. KEEFE.

THE

DENTAL COSMOS.

VOL. LII. MARCH 1910. No. 3.

ORIGINAL COMMUNICATIONS.

"BONE-GROWING."

By EDWARD H. ANGLE, M.D., D.D.S., New London, Conn.

(Read at the fourth annual meeting of the Alumni Society of the Angle School of Orthodontia, New York, N. Y., November 1908.)

DOUBTLESS you will be surprised at the title of my paper, and you will ask what bone-growing has to do with orthodontia. My answer is that it is probably the most important problem in orthodontic treatment. Indeed, most of our successes in treatment depend on our success in bone-growing, and if the orthodontist does not succeed in growing bone he will find, in time, that the teeth he has moved so dextrously and satisfactorily have all returned to, or very nearly to, their original positions. For this reason the branch of science which Dr. Noyes teaches us—histology—when it is understood and its relation to orthodontia really comprehended, will probably be accepted as the most important of any subject in the orthodontic curriculum, because it has so largely to do with the science of bone-growth.

Let us remember that malocclusion of the teeth is always associated with a lack in the growth of bone, or the perverted growth of bone, in degree corresponding exactly with the degree of malocclusion. Nature attempts to build a denture, a face, a skull, and all other parts of the anatomy to be in accordance throughout with a type she has designed for the individual; but for some reason some of her processes in the building of the different parts may have been interfered with. The result, as we find it, is perversion or arrest in the growth of the alveolar process, jaws, and associate bones, and malocclusion.

Dr. Noyes has again and again tried to impress us at the school with the fact that "bone grows as a result of mechanical stimuli," and I would ask you to keep his "creed" in mind.

Now, in order to grow bone, the orthodontist depends on the increased stimulus given to the bone-cells by the more normal functionating of the teeth as a result of the establishment of normal occlusion. This stimulus, plus that given by the establishment of the normal functionating of lips and tongue, will, in

favorable conditions, as we have recently learned, result in marvelous changes in the growth of the bone, and yet these stimuli are apparently not enough in many cases to bring about such results in bone-growth and development as we would wish.

picture of a leaning post which had been driven into the ground, being tipped to upright position. But that as a result of the establishment of normal occlusion and the forces incident thereto there would be given such a stimulus to bone-cells and other tissues as would cause

Fig. 1.

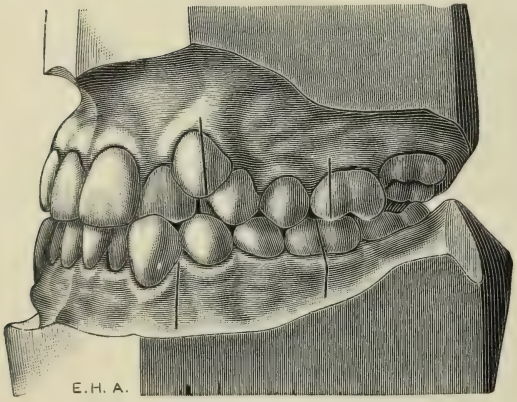


Fig. 2.

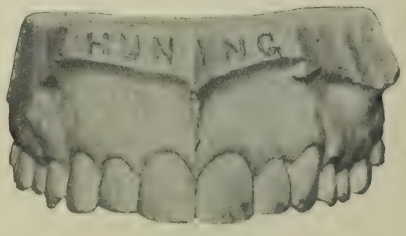


To make this point clear, let me go back a little in the history of orthodontia.

You know that orthodontia had long been burdened and seriously handicapped by the belief that small jaws and large teeth had in some mysterious way become mixed up through heredity, resulting in malocclusion. Following this, logically, was the necessity for extraction in treatment in order to harmonize the disparity in size between the jaws and teeth. Of course we had long known that there was some little bone-growth as a result of tooth movement, supposing it to be limited chiefly to the alveolar process over the gingival half of the roots of the teeth, and that as a tooth was tipped into upright position the bone in front of it was absorbed, and on the opposite side of the moving tooth bone was built in, and it was thought that mechanical support of the teeth was only necessary until this building-in of bone was complete. You have all read this a hundred times in the old writings, and well remember how it was illustrated by a

nature to develop bone on a large scale, complete the full growth of the alveolar process, shift the very apices of the roots of the teeth to their proper positions labially and buccally, remodel completely the form of the vault of the arch, the

Fig. 3.



floor of the nose, the size and proportions of the maxillary bones, and probably all other bones of the face, was not realized. So I think the happiest moment of my life in connection with orthodontia was when I discovered in the case shown in Fig. 1 that nature would do these things, and I believe that the pictures represent-

ing this case have the greatest historical value of any pictures in orthodontic literature. I want you to note the pronounced lack of development of the bone, see how greatly the arch is diminished in size, and how narrow and deformed is the vault of the arch—another instance of "the large teeth of one parent and

Fig. 4.



especially in the region of the roots of the incisors. And this is not an unusual case by any means—you have seen hundreds of similar ones, both in regard to malocclusion and lack of bone-growth.

small jaws of the other," you know—plainly demanding extraction. But I could not bring myself to the point of sacrificing any of those remarkably beautiful teeth. Instead, the crowns of the

Fig. 5.



I will not take time now to point out the difference in millimeters between the bone-development here and in the completed case (Figs. 4 and 5), but you will readily see in a general way how pronounced these changes are.

The second picture (Fig. 2) shows the occlusal aspect of the teeth, and you will

teeth were tipped labially and buccally to approximately their normal relations with the line of occlusion, but the resultant pronounced angle of inclination of the incisors, on account of the great arrest in the development of the alveolar process and intermaxillary bones, as shown in Fig. 3, often made me doubt

as to whether I would ever be able to maintain the crowns of the teeth in their corrected relations. But the teeth being in occlusion and their normal functionating established, after two years of faithful retention I found the remarkable changes to have taken place that are shown in Figs. 4 and 5, and you can well imagine my joy, for I knew that here was a law that would apply in all such cases—that the time-honored saw of the mismating of jaws and teeth was here plainly proved to be a myth, a snare, and a delusion, and that extraction in such cases was no longer necessary but reprehensible, for it meant not only seriously and permanently deforming the dental apparatus, but the face as well. This latter fact I later brought out in a paper, "Art in Relation to Orthodontia" (published in *Items of Interest*, September 1903, page 646), with which you are all familiar.

But the story that these pictures tell, none of you yet fully appreciate. In fact no attention was paid to it when it was first brought out, and not until long afterward.

Fig. 6.



Fig. 7.



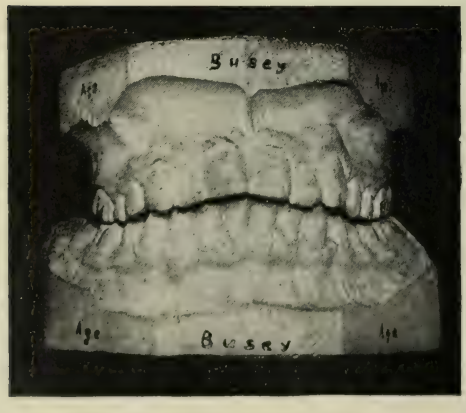
Fig. 8.



Fig. 9.



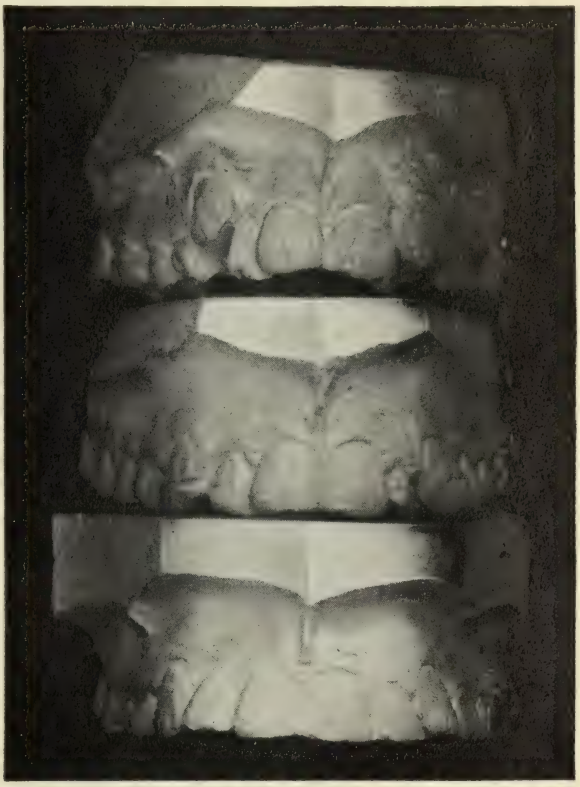
Fig. 10.



Let it be remembered that the growth of bone in this case took place under favorable circumstances, a healthy child at the age of eleven years, yet difficult retention for more than two years was required to effect the changes shown. And another case, shown in Figs. 6, 7, 8, 9, and 10, where the greatest amount of bone-building has followed tooth movement of any case so far reported, required three years of retention at a most favorable period of life.

In the very great tissue changes that have taken place in all such cases as those just described, it must be apparent that there is a vast amount of tearing down of bone by the osteoclasts and its rebuilding by the osteoblasts, as well as similar cellular and structural changes of the other tissues involved. Very naturally—and this is a fact proved by experience—these changes are most active and the growth of bone most pronounced in cases treated during the active period of growth and development of the dental apparatus, this activity diminishing with advancing age, necessitating longer periods of retention as the patient nears maturity, and after maturity the development is very slow and is never complete, as shown in the case in Fig. 11, in which the period of retention had covered four years.

Fig. 11.

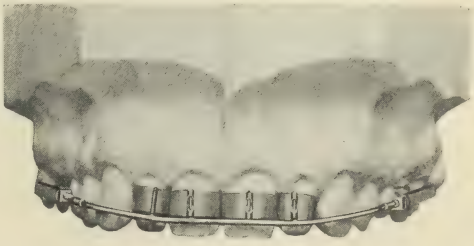


THE "WORKING RETAINER."

With a view of expediting the treatment of malocclusion by shortening the period of retention in these cases, the writer has devised a method of retention by which he believes the cells involved in these tissue changes will be gently stimulated to greater and longer activity, with the more speedy and complete development of the tissues.

The device is shown in Fig. 12, and has for its purpose not only to support the crowns of the teeth in their corrected relations with the line of occlusion, but at the same time to exert a very gentle but constant force labially on the roots of the incisors. It may be regarded as a "working retainer," as appropriately named by a former student of the writer, Dr. George B. Palmer.

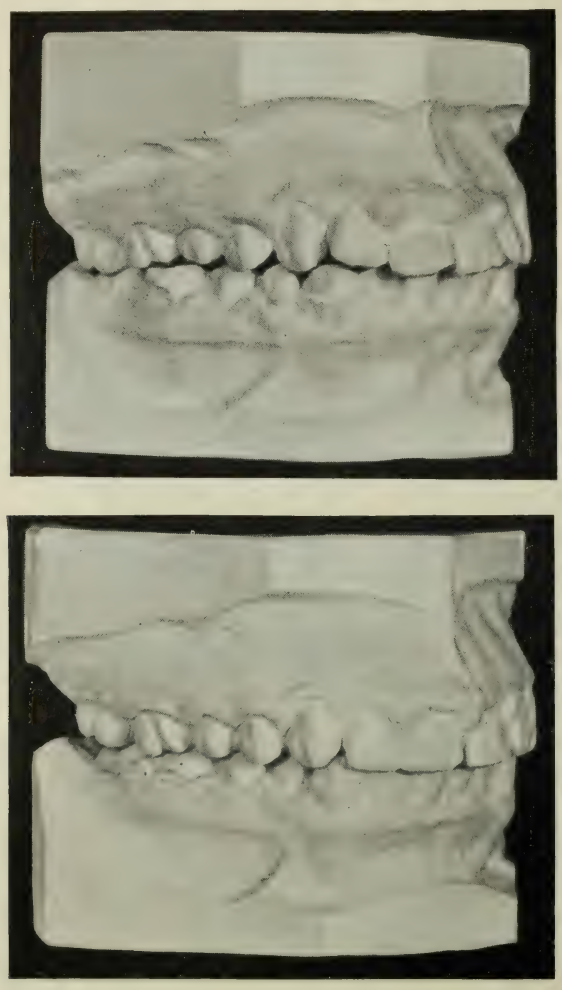
Fig. 12.



The publication of this device has been

delayed so that its usefulness might be practically demonstrated, and this was done first by Dr. A. H. Ketcham, in the case shown in Fig. 13—reported at the fifth annual meeting of the Alumni Society of the Angle School of Orthodontia, December 1909—in which the very gratifying results shown were obtained after six months' wearing of the device.

Fig. 13.



The device is made by removing the segment between the threaded ends of the expansion arch that has been employed in accomplishing the movement of the teeth, and substituting for it a segment, of the same length and curve, of very delicate and elastic iridio-platinum and gold wire, twenty-nine thousandths of an inch in diameter, attaching the ends of this wire to the threaded ends of the original arch with twenty-two karat gold solder. Very small tubes are soldered perpendicularly to the labial surfaces of delicate iridio-platinum bands previously very carefully fitted to the crowns of the incisors. These tubes must be parallel with each other, their incisal ends resting in contact with the middle segment of the arch.

Very delicate spurs, of the length and

diameter of the bore of the tubes, or twenty-two thousandths of an inch, are soldered to the arch at points opposite the mouths of the tubes and at angles exactly corresponding to the bore of the tubes when the arch is in position. The ends of the spurs are then gently inclined forward about three thirty-seconds of an inch by bending, the arch replaced upon the teeth, and the spurs sprung into the tubes. Thus a gentle force from the elasticity of the spurs and arch combined is given to the roots of the teeth in a labial direction, while the crowns are given stationary support in all directions.

The writer believes that such a gentle, harmless stimulus is thus given as will accelerate cellular activity and greatly lessen the time usually necessary for bone-growth and retention, besides effecting final results in bone development which would otherwise be impossible when the patient is nearing maturity.

As the alveolar process is developed and the apices of the roots of the teeth are moved labially, it is occasionally necessary to renew the force by further outward bending of the spurs, and in order to avoid the necessity of removing the arch and the possible accident of its being unfavorably bent, the writer recommends that a portion of the center of the tubes be removed with a round file, as shown in the illustration. This arch may then be sprung slightly downward, the ends of the spurs caught with a delicate excavator where the tubes are cut away for the purpose and given the necessary bend, then the spurs sprung back into position. This, however, should not be done oftener than once in one or two months.

By studying the possibilities of this device it will be seen that we have absolute control over the development of the positions of the teeth in their entirety, far more so than by the use of any other known retaining device. First, the most perfect support is given to the crowns of the teeth in all directions; second, the crowns may be shifted labially or lingually by tightening or loosening the nuts in front of the anchor bands; third, the positions of the roots of the teeth may be developed labially or lingually, mesially or distally, by a gentle force from the proper bending of the spurs, independent of the active or passive retention of the crowns of the teeth; fourth, force for rotation or for the prevention of rotation of any of the teeth may be given by partially flattening the ends of the delicate spurs and the ends of the tubes in which they are engaged, then giving the spurs a slight twist and re-springing them into position; finally, all of the teeth may at the same time be lengthened or shortened, if so desired, by giving the necessary downward or upward spring to the segment of arch.

Of course, in like manner support and movement may be given to the canines and premolars, and by drilling through the sheaths of the tubes of the anchor bands and the sides of the threaded portion of the arch and inserting delicate keys therein, force may be exerted through the elasticity of the arch for the movement of the molar roots, either buccally or lingually.

In making use of this device the arch may be placed above the tubes instead of below them as shown, or, in favorable cases where the occlusion will permit, the arch may be placed lingually to the teeth, with the tubes either parallel with or at right angles to the long axes of the teeth; but all things considered, the position given the device in the illustration will be found to be the most satisfactory.

It is also equally applicable to the lower dental arch.

Of course the device may be operated either as a regulating or retaining appliance, or both, as its name implies, but the writer believes its greatest usefulness will be as a bone-stimulant, and when so used it should be very delicate, as described, so that only such gentle force will be given to the roots of the teeth as to physiologically stimulate the bone-cells. Great force and rapid movement of the apices of the roots of the teeth the writer believes to be unphysiological.

THE PROBLEM OF ARTICULATION.*

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Translated by OSCAR T. WAYNE, D.D.S., Zurich.

(Continued from page 169.)

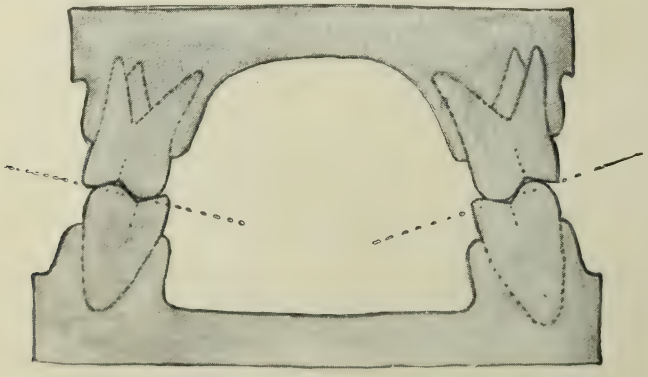
(III.)

CHAPTER V (continued).—PART III: THE MASTICATORY GROOVE OF THE MOLARS.

IF an upper or lower molar is examined from its mesial aspect, it will be seen that the inner surfaces of the buccal and lingual cusps form a groove. For convenience of description I shall call this the masticatory groove.

If a plaster model of a perfectly normal set be secured from an adult who has worn away all disturbing cusps by many years of use, and a transverse section be made with a saw in the region of the second molars (see Fig. 60), it will be seen that the deepest point of this masticatory groove does not lie in the center of these teeth, but rather more toward the buccal side in the upper molars and toward the lingual side in the lower molars. Furthermore it may be seen that the upper buccal and the lower lingual cusps are thin and sharp, while the upper lingual and the lower buccal cusps are broad and round, and fit into the sulci of their antagonists.

FIG. 60.

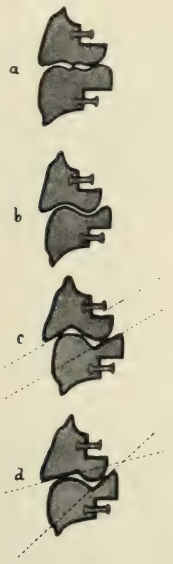


In grinding the grooves in the artificial teeth, as is the custom today, in order to reproduce this masticatory groove in the natural teeth, it is better to make them angular, as in Fig. 61, *c*, and not rounded as at *b*, as recommended by Bonwill, because if a round groove

* A translation of Professor Gysi's book, "Beitrag zum Articulationsproblem," published by Hirschwald, Berlin, in 1908, with some practical additions written since its publication.

is made in the molars they meet upon an altogether too broad a surface, whereby their function is impaired, such an arrangement requiring much more strength in crushing the food. The masticatory muscles have strength enough, but the alveolar ridges with their thin covering of tissue will not always withstand the great pressure required by rounded cusps fitting into a round groove, and the

FIG. 61.



a, *b*, *d*, Incorrect form of the masticatory surface. *c*, Correct form.

patient can only with great effort comminute foods and the proper mastication of meats is impossible, especially with flat, weak, and sensitive alveolar ridges. If, on the contrary, the molars are ground with angular grooves, as at *c*, Fig. 61, the three contact points of the molars represent a long thin line, making the actual contact a very small one. The result is a pure wedging process, in which the food is easily penetrated and crushed and is finely comminuted in the lateral movements.

In young persons the buccal cusps are as sharp as the lingual ones, but those cusps that fit into the sulci of their antagonists are put to much harder usage in the masticatory movements, as they remain in contact in both right and left lateral movements, so that in time they become round, and in old age are almost flat; consequently the masticatory surface becomes more and more horizontal with the lapse of time.

The apparatus shown in Fig. 62 was constructed to determine the form of the masticatory groove. A schematic masticatory groove, which consists of two movable metal plates with a spring joint, is fastened to a wax bite-plate prepared on a lower plaster model which has been fastened to my articulator. This schematic groove must be placed so that it points in the same direction to the joint as the row of the lower natural teeth. To the upper bow of the articulator a pin is attached that can be moved in the three directions of space so that it can be exactly placed and fixed at any part of the deepest point of the artificial groove. This pin represents the lingual cusp of an upper molar. The two metal plates forming this groove are held in an upright position by springs. The degree scale attached at the back of the movable groove registers the angle of the slant taken by the buccal and lingual plates of the artificial groove in lateral movements. The path taken by the molars in masticatory movements can plainly be seen if the metal plates are covered with dark-colored wax, and if the pin is placed in the region of the different molars the differences in their movements may be observed.

In this manner better results are secured than by a geometrical construction of two dimensions, because these results are secured by an apparatus that allows of movements in three dimensions.

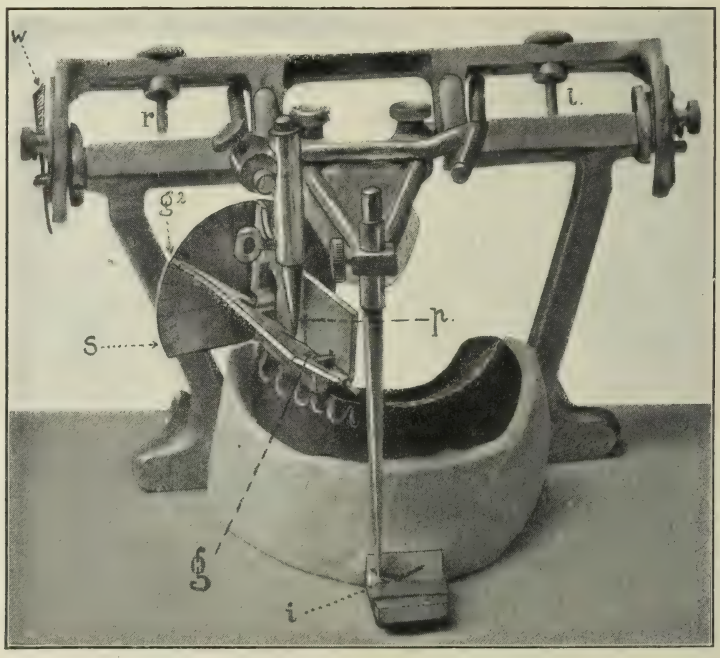
In Fig. 63 the knowledge gained by the use of the apparatus as shown in Fig. 62 is demonstrated in two drawings. The upper pin was placed in the region of the first molar in the groove formed by the metal plates (I in Fig. 63), and lateral movements were made. In a right lateral movement, point I makes a movement around condyle *R* toward point II almost in the direction of the masticatory groove. During this

movement the buccal plate of the artificial groove assumes a steeply inclined position. The path describes the arc of a circle having a radius of 94 mm. In a left lateral movement, on the other hand, the point I will move around condyle *L* toward point III with a radius of only 74 mm. The path described is correspondingly shorter and is at a right angle to the lingual surface of the groove.

of this cusp. The path from I to III leads directly to the top in a short and direct way, while the path from I to II takes a longer but less steep way to the top.

When the upper pin is placed upon the artificial groove in the region of the second molar, and lateral movements are made of the same length as in the experiments described above, the pin will

Fig. 62.



Experimental apparatus to determine the form and position of the masticatory groove of the molars. The results are shown in the four large molar plates (p. 273 *et seq.*).

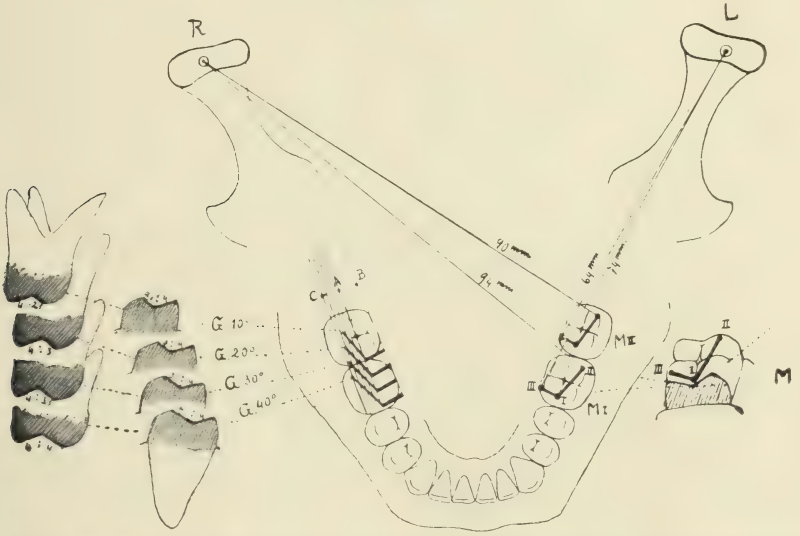
During this movement the buccal plate of the artificial groove assumes an almost horizontal position. In other words, point I, corresponding to the lingual cusp of an upper molar, rises upon the slightly inclined surface of the lingual cusp of the lower molar to point III by the shortest way—that is, directly to the summit of this cusp (see *M*, Fig. 63). In a right lateral movement, point I rises upon the steeply inclined surface of the lower buccal cusp in an oblique and long path toward point II, the summit

describe shorter paths, because the corresponding radii are shorter. This explains why the second molars need not be so broad as the first molars. The farther away a tooth is from the rotation point, the larger is the path described.

The left portion of Fig. 63 shows the results of another experiment. The two metal plates representing the lower groove were covered with dark-colored wax. The upper pin was placed in this groove in the region of the first molars

on the right side. Lateral movements were made with the condyle path slanting from 10° to 40° consecutively. In

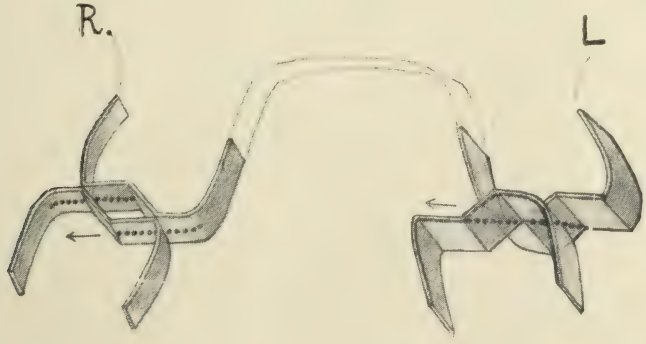
Fig. 63.



Shows on the lower molars the path of the upper molars in lateral movements, and the relationship between the masticatory groove and the condyle path.

left lateral movements around condyle *L* the buccal plate (representing the buccal wall of the groove) will assume an increasingly steeper position as the condyle path slant is increased (see Figs. 64 and 65), consequently the upper pin moves upward at an increasingly steeper angle on the inclined buccal wall, and attains thereby an increasingly greater lateral divergence of the path toward the summit of the lingual cusp. This may be made clearer by stating that with a condyle path of 40° the comparative relations of the width of the lingual surface of the groove to the buccal surface may be expressed as being 4 to 4; with a condyle path of 30° as 4 to $3\frac{1}{2}$, with a condyle path of 20° as 4 to 3, and with a condyle path of 10° as 4 to $2\frac{1}{2}$. (See left side of Fig. 63.) These differences may be observed in natural

Fig. 64.



teeth, and I was even able to verify these facts by examination of the new forms of molar teeth manufactured by the S. S. White Company, which fully prove the exactness of the modeling work of that firm in trying to imitate the natural forms of these teeth. With a knowledge of these laws the manufacturers should at last be in a position to accurately imitate the natural forms. The fantastic cusps that are still being manufactured will then become a thing of the past.

These experiments prove also the exactness of my articulator—for with no other articulator could these experiments be carried out, inasmuch as all others lack a reliable incisor guide.

The dotted lines on the schematic molars of Fig. 64 show the short path described by the right molars and the long path taken by the left molars in a right lateral movement.

The lateral inclination, the slant of the individual cuspal surfaces, and the depth of the groove are different in every patient according to the slant of the condyle path, its form, and the position of the balancing points.

With the same apparatus as shown in Fig. 62 I conducted experiments with the most common combinations of condyle path slants, balancing points, and incisor slants, to show the influence of these factors on the form of the masticatory surface of the molars. (See molar plates—pages 273 *et seq.*)

Key to the Molar Plates I–IV.

[Plate IV will accompany text of concluding instalment in our April issue.—Ed.]

I, Slant of the condyle path.
S, Slant of the incisor guiding surface.
C, Relations of the cuspal surfaces.
Ro, Position of the balancing points.
R, Right. *L*, Left.
F, Form of condyle path.
O.N.M., Normal occlusion of the molars.
O.X.M., Cross-bite of the molars.
——— Lateral inclination and depth of the masticatory groove.

In these experiments I have only used an incisor guiding surface of 60°, so as to simplify matters and not to complicate too greatly the illustrative plates. The combinations considered were condyle paths of 20°, 30°, and 40°, balancing points of 8, 10, and 12 cm., and three forms of condyle paths. As the results secured with a straight line and slightly S-shaped condyle path forms differed only very little, I have combined them. The plates show how the cuspal surfaces (which form the masticatory groove) vary, and how in consequence the opening angle of the groove varies. The masticatory surfaces become flatter as the opening angle becomes greater, and the cusps are therefore shorter. The degree of lateral inclination is also less with a shallow groove than with a deep groove.

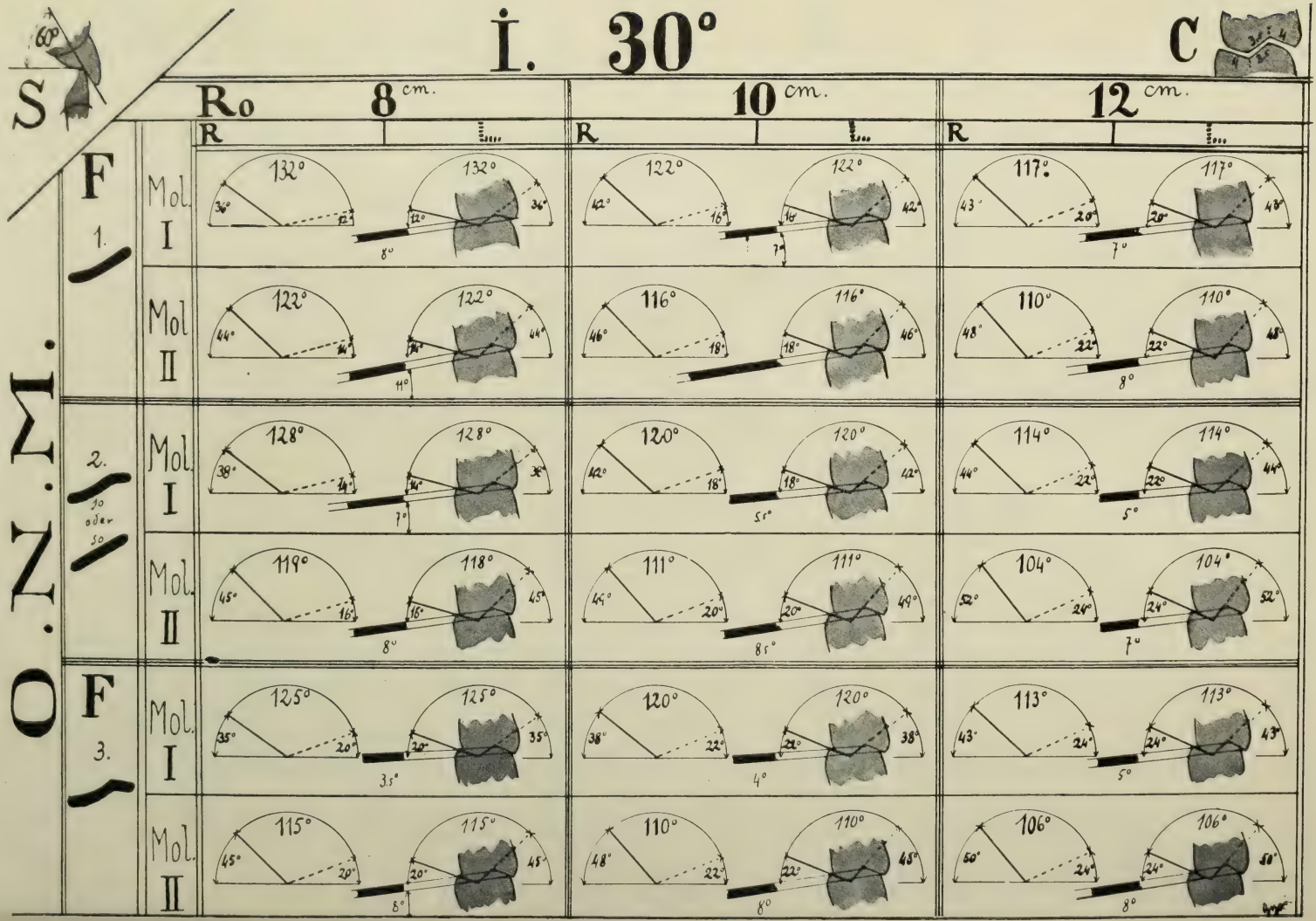
The molars of artificial dentures must be formed according to these relations as nearly as possible. Although few will be successful in carrying out exactly all the laws governing the construction of artificial dentures, the practitioner should at any rate be familiar with them, so as at least not to do anything contrary to these laws, as is unfortunately often the case.

As it is much too difficult a task to utilize with full accuracy the results represented in the plates, I have simplified and condensed plates I–III into the table shown in Fig. 65. In this table I give only the two forms of condyle paths as supplied by the articulator. These two forms cover the needs of most cases.

In this simplified presentation I have divided the numerous and varied opening angles into four classes or types—viz, A, B, C, D—each representing nine opening angles. Type A, for example, represents opening angles of from 126° to 134°.

In this way we have four chief types, the difference between these individual types being pronounced enough to be reproduced; and this can be quickly and easily accomplished by using the "type guide" (Fig. 66)—a piece of brass plate with four corners shaped to represent the angles of the four chief types. With the help of this handy guide the grooves of the molars can be quickly and accurately ground to the proper opening angle for every special case, making guess-


I. 20°
S
C
Ro
8 cm.
10 cm.
12 cm.
R
L
O.N.M.
F 1.
F 2. 30 oder 10
F 3.
Mol. I
Mol. II
134° 134° 32° 14° 2° 14° 32°
132° 132° 36° 12° 6° 12° 36°
131° 131° 35° 14° 5° 14° 35°
120° 120° 44° 16° 7° 16° 44°
126° 126° 32° 22° 1° 22° 32°
117° 117° 39° 24° 2° 24° 39°
126° 126° 36° 18° 3° 18° 36°
122° 122° 40° 18° 4° 18° 40°
122° 122° 40° 16° 4° 16° 40°
114° 114° 46° 20° 6° 20° 46°
121° 121° 35° 24° 0° 24° 35°
109° 109° 45° 26° 1° 26° 45°
118° 118° 40° 22° 3° 22° 40°
114° 114° 44° 22° 4° 22° 44°
116° 116° 42° 22° 4° 22° 42°
107° 107° 48° 25° 5° 25° 48°
115° 115° 40° 25° 1° 25° 40°
105° 105° 50° 25° 4° 25° 50°


I. 30°
C
S
O.N.M.
Ro
8 cm.
10 cm.
12 cm.
R
F 1.
F 2.
30 oder 50
F 3.
Mol. I
Mol. II
132° 132° 36° 22° 12° 36° 8°
122° 122° 44° 24° 24° 44° 11°
128° 128° 38° 24° 24° 38° 7°
119° 118° 45° 16° 16° 45° 8°
125° 125° 35° 20° 20° 35° 3.5°
115° 115° 45° 20° 20° 45° 8°
122° 122° 42° 18° 18° 42° 7°
116° 116° 46° 18° 18° 46°
120° 120° 42° 18° 18° 42° 5.5°
111° 111° 49° 20° 20° 49° 8.5°
120° 120° 38° 22° 22° 38° 4°
110° 110° 48° 22° 22° 48°
117° 117° 43° 20° 20° 43° 7°
110° 110° 48° 22° 22° 48° 8°
114° 114° 44° 22° 22° 44° 5°
104° 104° 52° 24° 24° 52° 7°
113° 113° 43° 24° 24° 43° 5°
106° 106° 50° 24° 24° 50° 8°


I. 40°
S
C
Ro
8 cm.
10 cm.
12 cm.
R
O.N.M.
F 1.
F 2.
F 3.
Mol. I
Mol. II
122° 122° 44° 14° 14° 44° 13°
118° 118° 48° 14° 14° 48° 15°
117° 117° 45° 19° 19° 44° 10°
111° 111° 51° 15° 18° 51° 14°
109° 109° 48° 23° 23° 48° 10°
103° 103° 54° 23° 23° 54° 12°
122° 122° 44° 14° 14° 44° 13°
115° 115° 49° 16° 16° 49° 13°
116° 116° 46° 12° 18° 46° 13°
107° 107° 53° 20° 20° 53° 17°
110° 110° 48° 22° 22° 48° 11°
101° 101° 55° 24° 24° 55° 14°
125° 125° 39° 16° 16° 39° 8°
114° 114° 48° 18° 18° 48° 11°
118° 118° 42° 20° 20° 42° 9°
108° 108° 50° 22° 22° 50° 12°
113° 113° 44° 23° 23° 44° 8°
104° 104° 52° 24° 24° 52° 12°

work a thing of the past, and rendering exact and correct work easy.

surfaces, and the depth of the long groove also increase. They show, more-

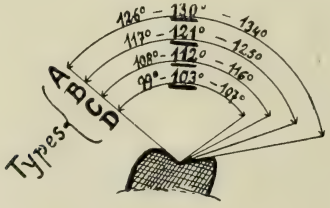
Fig. 65.

(*a*)

S. 60°	I.		15°–20°–25°			26°–30°–35°			36°–40°–45°		
	Ro.		8cm	10cm	12cm	8cm	10cm	12cm	8cm	10cm	12cm
	F. 2.	Mol. I	A	A	B	A	B	B	B	B	C
		Mol. II	A	B	C	B	C	C	B	C	D
	F. 4.	Mol. I	A	B	C	B	B	C	B	B	C
		Mol. II	B	C	D	C	C	D	C	C	D

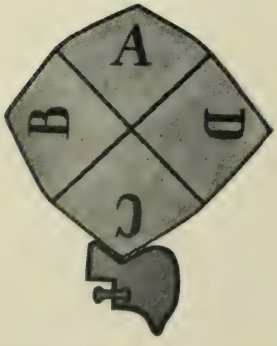
I, Slant of condyle path. Ro, Position of balancing points. F, Form of condyle path. S, Slant of incisors.

(*b*)



Plates I–III show plainly that as the degree of the slant of the condyle

Fig. 66.



Showing the use of the "type guide."

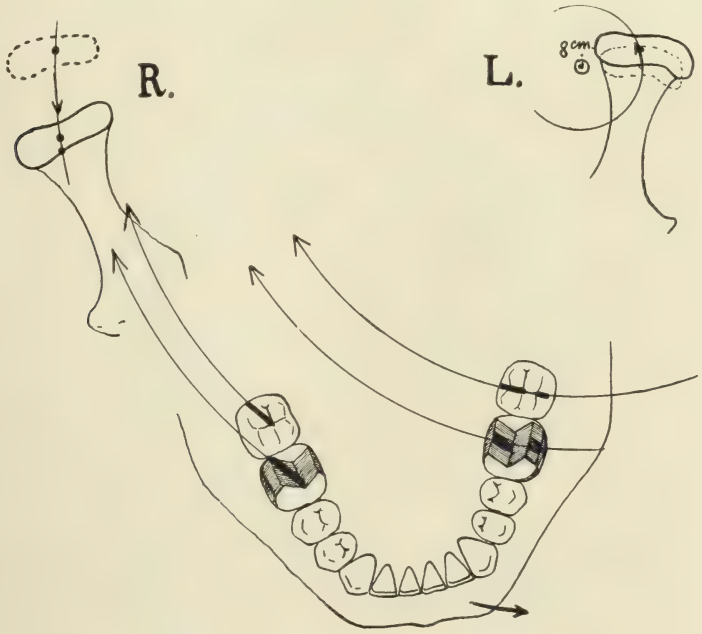
path and the distance between the balancing points increase, the degree of the lateral inclination, the slant of the cuspal

over, that the groove of the second molar is always deeper, the cusp surfaces steeper, and in consequence the opening angle smaller, than in the first molars—contrary to Bonwill's drawing (which still appears today in all books upon this subject), and to the theory that the cusps must be shorter as we go backward from the incisors to the molars. Spence in his latest communication on this subject (*Items of Interest*, August 1907) still presents this theory, as do Wilson (Cosmos, October 1908, Fig. "6"), DeWitt Cross (Cosmos, January 1909, page 38, Fig. "9") and lately Turner (Cosmos, March 1909, page 297). This illustration is apparently so convincing that it has been accepted and passed on. As a fact, the groove between the mesial and distal buccal cusps (called the "clearance space" by Turner (Cosmos, March 1909) does not so deeply

divide these cusps. The masticatory groove lies deeper than these buccal "clearance spaces," and as the length of the cusps should be measured from the bottom of this groove, the cusps are in reality longer as we go backward. (See Fig. 89, Nos. 3 and 4, and Fig. 90.)

The table in Fig. 65 shows that all types can occur sometimes in the first molars and sometimes in the second molars.

FIG. 67.



As I have already shown (see Fig. 10 with accompanying tabulation of cases), the relations of the joints are alike on both sides in only about 50 per cent. of all cases. As a rule, however, we can with little trouble use these tables for every special case in which the right and left sides differ. This I shall try to explain by the aid of Fig. 67.

In a left lateral movement the mandible moves around the left balancing point, while the right condyle glides forward and downward. The upper and lower cusps that are in action in this movement are marked by arrow-pointed lines in Fig. 67.

The following laws may be derived from this illustration: The lines elongated toward R (right) show that these cuspal surfaces are determined by—(1) The right condyle, and (2) The left balancing point. In a right lateral movement, with the cusps on the other side in action, an elongated line would show that these cuspal surfaces are governed by—(1) The left condyle, and (2) The right balancing point. (In the molar plates the line elongated toward the left is represented by a dotted line, the other by a plain line.)

With the help of these laws and the molar plates the proper masticatory surface relations can be determined for every special case. For example, a case presents itself with the following characteristics:

Right side—Condyle path 40°, path form 3, balancing point 12 cm.

Left side—Condyle path 20°, path form 1, balancing point 8 cm.

According to the law derived from Fig. 67, this would be transformed into—

Right side—Condyle path 40°, path form 3, and the left balancing point of 8 cm., governing the surfaces corresponding to those marked in Fig. 67 by a line pointing to the right condyle, and in the molar plates by a plain line.

Left side—Condyle path 20°, path form 1, right balancing point of 12 cm., governing the surfaces opposite to those marked in Fig. 67 and in the molar plates by a dotted line.

From the molar plates we can secure the following masticatory surface relations for this case (Fig. 68).

These results can be more easily and accurately secured by mounting on the wax bite-plate the instrument shown in Fig. 62. With this it is only necessary (after the proper data as to the joint relations have been obtained) to correctly figure out the opening angle of the respective type.

Artificial dentures constructed in this manner require more time than those constructed without regard to any rules, but the results secured are of heretofore unknown excellency.

For those who have not the time, or who would like to try the simplest method first, I have prepared the following table:

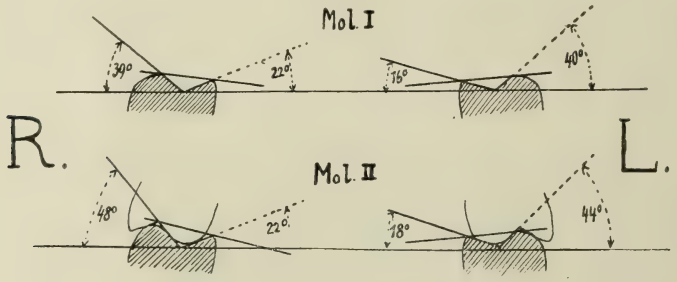
Grind the grooves for a condyle path of—
About 15°, after type A.
" 25°, " " B.
" 35°, " " C.
" 45°, " " D.

For those who would desire to give a little more attention to detail I have prepared the following:

Grind the grooves for a condyle path of—
About 20°, after types A and B—A for first molars, B for second molars.
About 30°, after types B and C—B for first molars, C for second molars.
About 40°, after types C and D—C for first molars, D for second molars.

For those who wish to be more exact and to take into consideration the form of the condyle path and the balancing points, Fig. 65 is available. For example, let us consider that we have an

FIG. 68.



We will now determine the opening angle of the grooves and the resulting type:

RIGHT SIDE.

First Molar.

90° 90°
— 39° — 22°
51° + 68° = opening angle 119° = type B.

Second Molar.

90° 90°
— 48° — 22°
42° + 68° = opening angle 110° = type C.

LEFT SIDE.

First Molar.

90° 90°
— 16° — 40°
74° + 50° = opening angle 124° = type B.

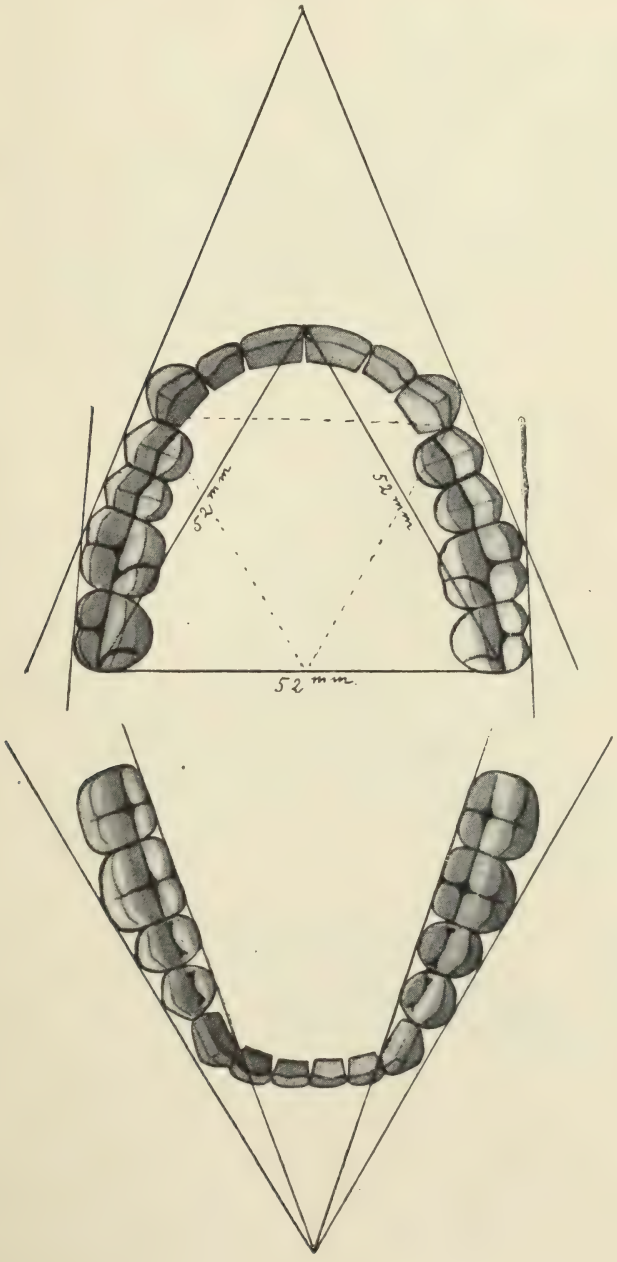
Second Molar.

90° 90°
— 18° — 44°
72° + 46° = opening angle 118° = type B.

S-formed condyle path with balancing points of 12 cm. In this case the first molars are ground after type C, and the second molars after type D.

If one wishes to be still more exact, and when there is a difference between the left and the right side to be considered, one can proceed in the manner

FIG. 69.

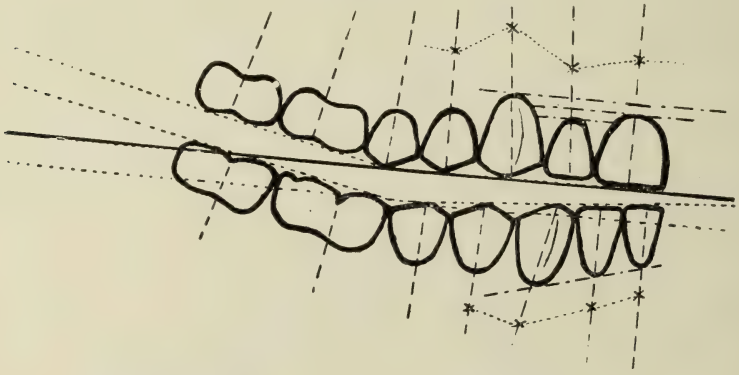


described under Figs. 67 and 68, or by using the small arrangement auxiliary to the articulator shown in Fig. 62.

I have described four different ways groove in the angular form as advised in another chapter.

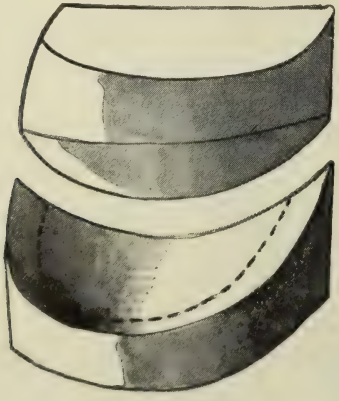
With a little practice all the teeth can be correctly ground before starting

Fig. 70.



for grinding the molars correctly, and it is perhaps best to start with the first and easiest way; experience will bring the desire to proceed to the more difficult but more correct methods.

Fig. 71.



For grinding the molars I use a large emery wheel of about 10 cm. diameter, and 1 cm. thickness, the edge of which is beveled with an old heated file to form an angle of 45°. The large diameter enables one to grind the grooves so that they will run in a straight line across the tooth and not be too much curved. A wheel of this shape will easily cut a

to set them up, so that afterward only a little grinding is necessary by way of adjustment before proceeding to automatically arrange the dentures by pressure as advised in Chapter IV.

All these rules and laws may look formidable to the practitioner. I would, however, remind him that to do good work in any branch of science or art the fundamental rules must be learned. With experience it is only necessary to have these laws in our minds, and in the construction of artificial dentures it is generally needless to consult our books for exact measurements.

CHAPTER VI.—Practical Remarks on the Lines of the Arches.

The arches have the form of a parabolic curve. The incisors and canines of both arches form part of the arc of a circle. The bicuspids and molars run back on each side in almost parallel straight lines, with a slight divergence buccally of the lower molars and a slight divergence lingually of the upper molars. (See Fig. 69.)

The distal cutting edges of the canines of both upper and lower arches should point in the direction of the molars, the

necks of these teeth only being prominent, allowing the bicuspids to be placed so that they are only slightly visible from the front.

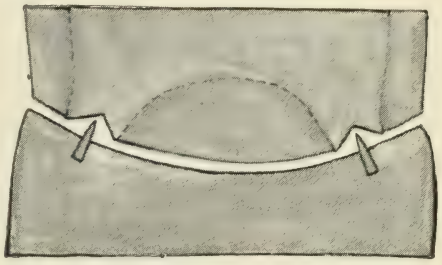
The arches viewed from the side show a curve from the front to the rear, the curve being greater in the lower arch, depending on the length of the overbite of the upper incisors. This curve begins to go upward back of the first molars, but in the construction of artificial dentures the curve should begin to become greater back of the bicuspids, as the third molars are not used in such dentures. (See Fig. 70.)

Two straight lines touching the buccal surfaces of the bicuspids should touch the mesial corner of the first molars and the distal half of the canines. The intersecting point of these lines should be at the same distance from the incisors as the incisors are from a line drawn across the base of the arch. (See Fig. 69.)

A side view of the upper arch shows that the incisors, canines, and bicuspids are all on the same level, while the two molars are on a curve bent upward from this level.

In the previous chapter I called attention to the fact that it is important to place the teeth exactly over the alveolar ridges. (See Figs. 57 and 81.)

FIG. 72.



Mechanical production of the masticatory groove.

FIG. 73.



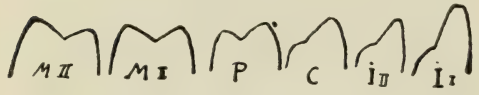
I, Path of the incisor guide.

This is important, as it prevents to a certain extent the artificial dentures from being displaced during mastication. The best vacuum chamber cannot prevent this if the teeth are not set up according to this rule.

By following the above rules there is very little danger of the teeth being set

too far over the alveolar ridges, but in many edentulous mouths the arches are much changed owing to resorption of the ridges. In these cases all the foregoing rules and theories must be regarded as of secondary consideration to this important rule—that of placing the teeth over the ridges.

Fig. 74.



Hahn, in the *Correspondenzblatt für Zahnärzte,* October 1907, called attention to the fact that Spee's curve and the molar cusps are of no value at the moment the food is first seized by the teeth, as the dentures are not yet closed. For this reason the teeth must be so placed that they will balance the dentures in the very beginning of the masticatory act.

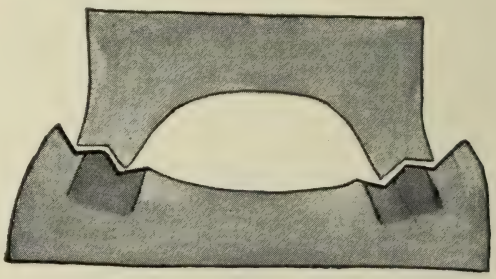
CHAPTER VII.—The Mechanical Formation of the Teeth.

The position of the molars, their inclination, and their forms, are by the laws of nature dependent on all the foregoing facts. To show that the forms of the masticatory surfaces of artificial teeth must necessarily have the same form as those of the natural teeth, I submit the following experiment, which was made on my articulator. The facts considered in correctly reproducing the various movements of the mandible were—(1) Bonwill's equilateral triangle with sides of 10 cm. length. (2) A condyle path of 33° (the average inclination). (3) An incisor guide of 60° (the average slant of the lingual surfaces of the upper central incisors), the importance of which has been heretofore overlooked.

Two blocks of plaster mixed with much chalk (to make them as soft as possible), with smooth flat surfaces, were fixed on an articulator without incisor guide, and Christensen's (Dental Cosmos, October 1905) experiment (after Fick) was made, with the result shown in Fig. 71. This shows plainly Spee's curve, but it is only the tooth curve of ruminants, without incisal overbite.

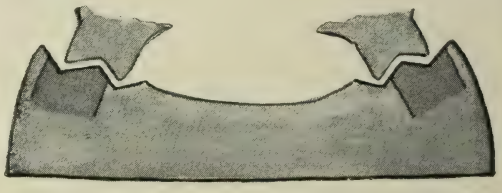
On the dotted line of the lower block shown in Fig. 71 a thin strip of metal

Fig. 75.



was fastened upright and parallel to the outer contours of the block, and 10 cm. from the balancing points in the incisor region. The balancing points were placed 10 cm. apart, thus forming a Bonwill triangle. An incisor guide of

Fig. 76.



60° was then added to the narrow end of the lower bow of the articulator, thus fully reproducing all the average conditions. Movements were then made in all possible directions, and the sharp strip of metal cut a groove in the upper block that corresponded exactly to the masticatory surfaces of the natural teeth. (See Figs. 72 and 73.)

By cutting away the plaster on both sides of this groove (following the dotted line in Fig. 72), a schematic form of the upper row of teeth in man is secured. It is only necessary to divide this schematic tooth-row into sixteen parts to secure the individual teeth in a schematic form. (See Fig. 74.)

In Fig. 74 the tooth curve, the slant of the masticatory surfaces, and the difference in the height of the cusp rows, may be plainly seen.

The result of another experiment is shown in Fig. 75.

A schematic metal tooth-row formed like that secured in the previous experiment (Fig. 73) was fastened to the upper bow of the articulator. To the lower bow a block of plaster as in Fig. 71 was attached. The result of the masticatory movements is shown in Fig. 75.

Here we have secured a double groove, and the tooth-form may be cut from either the inner side of this double groove or from the outer side, as shown in Fig. 76. This is merely intended to show that the cross-bite position of the molars is just as effective as the normal arrangement.

These experiments open up an interesting perspective into the origin of the forms of the natural teeth.

(To be continued.)

A REPORT OF TWO CASES OF DENTIGEROUS CYSTS.

By D. N. CARPENTER, Surgeon U. S. Navy.

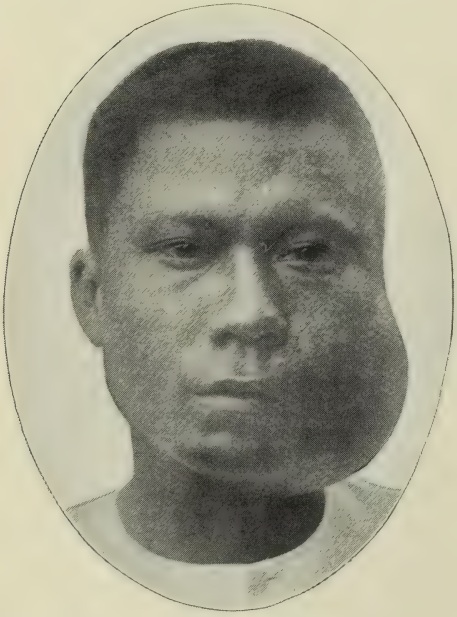
(Read before the union meeting of the Maryland State Dental Association and the District of Columbia Dental Society, Washington, D. C., October 28, 1909.)

RECENTLY, while consulting several text-books on dentistry, it was noted that the occurrence of dentigerous cysts is considered to be infrequent. This fact, therefore, is a sufficient reason for publishing the following two cases, which came under my observation during a recent tour of duty at the U. S. naval station, Cavite, P. I.

Case I. A Filipino, about eighteen years of age, applied for relief from a tumor of the left side of the face, which he stated had been getting larger during the past six years, when he first noticed it. Examination showed a large, firm tumor, apparently springing from the parotid region, and believed to be a sarcoma or osteochondroma of the parotid. A dentigerous cyst was considered, but after counting the teeth it was excluded, the count being apparently normal. A resection of the left half of the lower jaw was decided upon after consultation with several other naval surgeons, who agreed with the original diagnosis of sarcoma. The night before the operation I decided to make a second count of the betel-stained teeth of the patient, for the size of the growth had prevented opening the mouth to a sufficient width at the first examination. This time the lower left second bicuspid was found absent, and upon deep pressure over the growth on the inside of the mouth an indefinite cystic "spring" was obtained. At the operation on the following day, therefore, first a deep exploratory incision was made along the left alveolar border of the lower jaw, and immediately a milky cystic fluid was discharged. With the finger inserted through the incision the soft myxoid tissue was rapidly broken down, and search made for the missing tooth. A smooth tooth-like surface was found at the bottom of the cavity, and after considerable difficulty a long curved hemostat was successfully used to remove the tooth, which was situated at the root of the first bicuspid with the crown pointing outward. The tooth after removal was found to be deformed, especially the roots, either from absorption (?) or from lack of development, and one root was carious. The cystic growth was scooped out, and a gauze packing inserted. At the end of two weeks the tumor was of the same size as before, and a second operation was performed to remove the roof of bone which formed the external wall of the cyst. Under ether anesthesia a long incision was made along the inferior border of the jaw from the mentum to the angle, and all the tissues, including the periosteum, were reflected to the malar prominence. Attempts to enter the

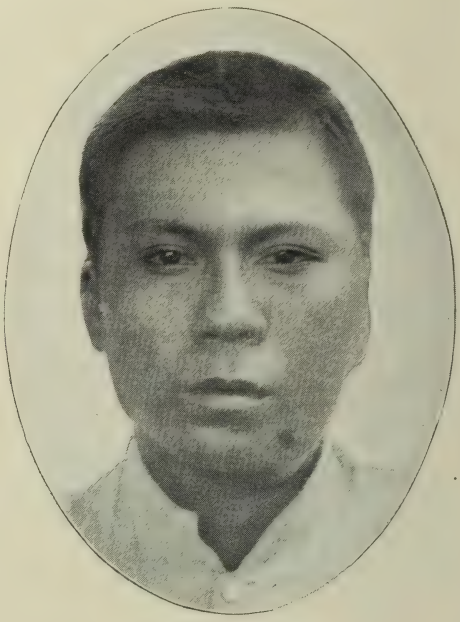
bony wall by chisels and trephines met with no success, as the bone was like ivory and resisted the instruments. Finally a small Hay's saw was used to cut two incisions, meeting like the letter V, and at the apex of these incisions a small chisel was introduced to prize back and break off the projecting triangle of bone. This opening permitted Rongeur forceps to enter, and the removal of this bone was quickly accomplished. It was curious to see the effect of the irritation of the misplaced tooth upon the cancellous tissue of the bone between the external and internal plates, producing a granulation tissue which had evidently become myxomatous, as shown by microscopic examination of the removed tissue. The deformity of the jaw internally could not be remedied, or that extending into the neck, because a sufficient support of bone to hold the remaining teeth on the alveolar border had to be left. The periosteum and tissues were sutured, leaving a small opening at the angle of the jaw for an iodoform drainage wick, which filled the cavity. A second separate wick was introduced through the incision in the mouth to permit as little infection of the external wound as possible. There was primary union by first intention of the external incision in a few days, after which a single drainage wick was inserted daily from the outside through the first incision after copious irrigations with bichlorid solution and dioxid. For about two months the dressings were continued, and small necrosed fragments of bone discharged, hastened toward the last by injections of silver nitrate solution and iodoform powder insufflations. The final result is well shown in the accompanying photograph, the only visible scar being a tiny depression where the external wick protruded. The inside of the mouth showed only a small scar. Movement of the jaw was obtained nearly to normal.

FIG. 1.



Dentigerous cyst in Filipino.

FIG. 2.



After operation.

Case II. A Filipino, about twenty-five years of age, presented with a poorly developed body and face distorted by a deformity of the lower jaw. Numerous healed sinuses of the left side of the face and neck were noted, which he stated had discharged for months, then had healed, only for new ones to appear. The jaws could hardly be separated, the development of the lower jaw was infantile. There was much pain extending over the left side of the face, and evidence of extensive necrosis of both

jaws. An incision was made through the swelling on the inside of the mouth, and a finger inserted. Particles of dead bone were felt on all sides, and high up a smooth tooth-like structure was felt. After a little patience the long hemostats were applied with the aid of the finger, and a deformed and much necrosed molar tooth was extracted. With the curet and forceps all free pieces of dead bone were removed, including the complete shell of the coronoid process of the mandible. One of the largest discharging sinuses was dilated with hemostats and used for external drainage. A large gauze wick was inserted, as in the first case, and the daily dressings and irrigations were continued. The result obtained was not the same as that of the first case, but it was amazing to see the rapid healing of the cavity and the amount of improvement of the jaw which resulted, even though much deformity of the face was left owing to the long continuance of the process, and nature's vain efforts to remove the offending tooth.

The contrast of the two cases shows the importance of early diagnosis, before extensive necrosis occurs, and both show the deformity which may result from that condition. The fact that the first case was believed to be a malignant growth demanding a most radical operation indicates how important it is in all such cases of tumors of the jaw to remember the possibility of there being a dentigerous cyst, and to definitely exclude this cause before attempting a resection of the jaw. The necessity, also, of operating through an external incision to remove the wall of bone, and also retain the periosteum to strengthen the jaw later, is well shown by the first case. The operation through the mouth had removed the tooth and cyst, but there was no relief of the deformity until the bony wall had been excised.

THE CHEMICAL CHANGES OF THE FOODSTUFFS DURING DIGESTION.*

By A. W. DOUBLEDAY, D.M.D., Boston, Mass.

(Read before the fifteenth annual meeting of the Northeastern Dental Association, Providence, R. I., October 7, 1909.

THE physiology of digestion consists chiefly in the study of the chemical changes that the food undergoes during its passage through the alimentary canal. It happens that these chemical changes are of a peculiar character. This peculiarity is due to the fact that the changes of digestion are affected through the agency of a group of bodies known as enzymes, or unorganized ferments, whose

* In October 1908 a paper was presented before the New York Odontological Society, entitled "Ploddings Toward Diagnosis by Salivary Analysis" (see COSMOS, April 1909, vol. li, page 412), with reference to the chemical changes taking place in living organisms of plants or animals; the derivation of our various foodstuffs: the digestion, absorption, and assimilation of same; the secretions, excretions, and eliminations, with special mention of the saliva; the crystallizable salts found in this liquid, and the pathological constituents of the same.

In April 1909 another paper was presented before the Boston and Tufts Dental Alumni Association, entitled "Microscopical Observations of the Saliva" (see *Journal of the Allied Societies*, December 1909, vol. iv, page 243), bearing on the chemistry of the saliva, action of the enzyme ptyalin, and the digestive functions of the saliva with regard to its action upon the foodstuffs, carbohydrates, proteins, and fats.—A. W. D.

chemical action is more obscure than that of the ordinary reagents with which we have to deal.

ENZYMES AND THEIR ACTION.

The term fermentation and the idea that it is meant to convey have varied greatly during the course of years. The word at first was applied to certain obvious and apparently spontaneous changes in organic materials which are accompanied by the liberation of bubbles of gas, such, for instance, as the alcoholic fermentations, in which alcohol is formed from sugar, the acid fermentations, as in the souring of milk; and the putrefactive fermentations, by means of which animal substances are disintegrated, with the production of offensive odors.

These mysterious phenomena excited naturally the interest of investigators, and with the development of chemical knowledge, numerous other processes were discovered which resemble the typical fermentations in that they seem to be due to specific agents whose mode of action differs from the usual chemical reactions, especially in the fact that the causative agent itself, or the ferment, as it is called, is not destroyed or used up in the reaction.

A most interesting feature of the activity of enzymes is that it is specific; the enzymes that act upon the carbohydrates are not capable of affecting the proteins or fats, and *vice versa*. So in the fermentation of closely related bodies, such as the double sugars, the enzyme that acts upon the maltose is not capable of affecting the lactose, each requiring seemingly its own specific enzyme. In fact, there is no clear proof that any single enzyme can produce more than one kind of ferment action.

You may ask, What is an enzyme? My reply would be made by quoting Oppenheimer's definition: "An enzyme is a substance, produced by living cells, which acts by catalysis." The enzyme itself remains unchanged in this process, and it acts specifically, that is, each enzyme exerts its activity only upon substances whose molecules have a certain definite structural and stereochemical arrangement.

The enzymes of the body are organic substances of a colloid structure whose chemical structure is unknown.

SALIVA AND CARBOHYDRATES.

The digestive action proper of the saliva is limited to the starchy foods. While the number of intermediate products may be large, the main result of the action of the ptyalin is expressed by the following simple scheme:

$$\text{Starch} \begin{cases} \text{Maltose} \\ \text{Erythrodextrin} \begin{cases} \text{Maltose} \\ \text{Achroödextrin} \end{cases} \end{cases}$$

The products formed in this reaction are probably not absorbed as such. The absorption takes place mainly, no doubt, after the food reaches the small intestine, where the maltose and the dextrin are probably acted upon by the inverting enzymes (maltase) and converted into the simpler sugar, dextrose. The ptyalin digestion seems therefore to be preparatory, and the combined action of ptyalin and maltase is necessary to get the starch into a condition ready for nutrition.

The chewing process in the mouth thoroughly mixes the food and saliva, or should do so, but the bolus is swallowed much too quickly to enable the enzyme to complete its action. Our recent researches have proved, however, that nature has made ample preparations for such emergencies, if not carried to excess, by allowing the salivary digestion to be carried on for a considerable length of time after the food reaches the stomach, accomplishing this in the fundic end, untouched by the ferment-destroying acid of the gastric juice for probably an hour or more.

FUNCTIONS OF THE SALIVA IN RELATION TO PROTEIN FOODS AND FATS.

In addition to the digestive action of the saliva on starchy foods, it fulfils other important functions with proteins and fats. By moistening the food it enables us to reduce the material to a consistence

suitable for swallowing and for the manipulation by the tongue and other muscles. Moreover, the presence of mucin serves doubtless as a kind of lubricator that insures a smooth passage along the esophageal canal. Finally, by dissolving dry and solid food it provides a necessary step in the process of stimulating the taste nerves, and the activity of the taste sensations may play an important part in the secretion of the gastric juice, which destroys the further action of the salivary digestion, and whose ferment (pepsin) converts the proteins to peptones and proteoses.

FATS.

Fats are probably not especially acted upon chemically until their entrance into the stomach, after which they are split up from neutral fats into fatty acids and glycerin, by the enzyme (steapsin) coming from the pancreatic secretions, the fat tissues, blood, etc.

DIGESTIVE CHANGES OF FOOD IN THE STOMACH.

As was stated regarding salivary digestion, it is probable that the ptyalin swallowed with the food continues to exert its action upon the starchy materials in the fundic end of the stomach for a long time, so that in this way the starch digestion in the stomach may be important.

Regarding the fats, it is usually believed that they undergo no truly digestive change in the stomach. They are set free from their intimate mixture with other foodstuffs by the dissolving action of the gastric juice upon proteins, liquefied by the heat of the body, and disseminated through the chyme in a coarse emulsion by the movements of the stomach.

The true value of peptic digestion is not so much in its own action as in its combined action with the trypsin of the pancreatic juice.

The digestion of the proteins of the food is accomplished by both enzymes, and normally we are justified in considering them together as effecting a peptotryptic digestion. Many facts seem to indicate that the peptic digestion is not so much an end in itself as a preparation for subsequent intestinal digestion.

ABSORPTION IN THE STOMACH.

In the stomach it is possible, according to Howell, that there may be absorption of the following substances: Water, salts, sugars, and dextrins that may have been formed in salivary digestion from starch, or that may have been eaten as such; the proteoses and peptones formed in the peptic digestion of proteins and albuminoids. In addition, absorption of soluble or liquid substances—drugs, alcohol, etc.—that have been swallowed may occur.

It was formerly assumed, without definite proof, that the stomach absorbs easily such things as water, salts, sugars, and peptones. Actual experience, however, made under conditions as nearly normal as possible, show that, upon the whole, absorption does not take place readily in the stomach, certainly nothing like so easily as in the intestine.

Fats probably undergo no digestive changes in the stomach, except when eaten in emulsified form. The processes of saponification and emulsification are supposed to be preliminary steps to absorption, and these processes take place usually after the fats have reached the small intestine. The fat that is not acted upon at all in the stomach is, of course, not absorbed, and even those fats in emulsified form which are partially saponified in the stomach escape absorption until they reach the small intestine.

DIGESTION AND ABSORPTION IN THE INTESTINES.

The food undergoes its most profound digestive changes in the intestines, and here also the products of digestion are mainly absorbed.

Pepsin and trypsin really act together—the change begun by the pepsin is completed by the trypsin. The preliminary action of the pepsin not only hastens that

of the trypsin, but to some extent alters it, a protein submitted first to pepsin and then to trypsin being more completely broken up than if the trypsin acted alone.

As distinguished from the pepsin, the trypsin hydrolyzes the hemipeptone still further, splitting it up into a number of much simpler crystalline bodies, such as leucin, tyrosin, etc.

The hydrolysis caused by the acids and by the trypsin seems to be nearly identical, although that caused by the acids is probably more complete. The numerous products caused by this complete hydrolysis consist chiefly of amino-acids, that is, organic acids containing one or more amino-groups (NH_2) in direct union with carbon. The nitrogen of the protein molecule appears in the split products in this form, and also partly as ammonia compounds. Some of these bodies are monamino-acids, that is, containing one NH_2 group, such as leucin, tyrosin, glycocol, and include substances belonging to the fatty acid series. Others are diamino-acids, containing two NH_2 groups. These latter include lysin, histidin, and arginin, which on account of their basic properties are frequently described as nitrogenous bases.

Amylopsin is found in the secretion of the pancreas, and its action upon starchy foods is closely similar to or identical with that of ptyalin. It causes an hydrolysis of the starch, with the production finally of maltose and achroödextrin. Before absorption the substances are further acted upon by the maltose of the intestinal secretion and converted to dextrose, and then to dextrin.

ABSORPTION IN THE SMALL INTESTINE.

Absorption takes place very rapidly in the small intestine. Anatomically two paths are open to the products absorbed. They may enter the blood directly by passing into the capillaries of the villi (or pleura), or they may enter the lacteals of the villi, pass into the lymph circulation, and through the thoracic duct of the lymphatic system eventually reach the blood-vascular system.

Recent investigations have proved that the digested and resynthesized fats are absorbed by way of the lacteals, but that the other products of digestion are absorbed mainly through the bloodvessels, and therefore enter the portal system and pass through the liver before reaching the general circulation.

Carbohydrates. Our carbohydrate food is absorbed, for the most part, as simple sugars, or monosaccharids. These simple sugars dialyze easily, and it would be natural to suppose that they are absorbed into the blood by a simple process of diffusion. As experimental facts do not entirely support this view, may we not assume that as with the other products of digestion, some of the work is done by the wall of the intestine itself, probably by the epithelial cells?

So far as the carbohydrates escape absorption as sugar they are liable to undergo acid fermentation from the bacteria always present in the intestine, and as a result of this fermentation there may be produced acetic acid, lactic acid, butyric acid, succinic acid, carbon dioxid, alcohol, hydrogen, etc.

Fats. It seems probable that some of the fat is absorbed directly by the bloodvessels of the villi, probably in the form of fatty acids or soaps. The portion thus absorbed enters the portal vein and passes through the liver before reaching the general circulation.

Proteins. Most of the experimental work on record shows that the digested proteins are absorbed by the bloodvessels of the villi, although after excessive feeding of protein a portion may be taken up also in the lymphatics.

The form in which protein is absorbed and circulates in the blood is not yet satisfactorily determined. Under normal conditions the protein food is digested by the successive actions of pepsin, trypsin, and probably erepsin. During this digestion peptones and proteoses are formed and may be absorbed as such, or they may be further broken down by trypsin and erepsin to the amino bodies, leucin, tyrosin, etc., and the intermediate compounds, the polypeptids or peptoids, and be absorbed in the form of these split products.

It is possible that many of the end-products of the digestive splitting may be further oxidized and converted to urea in the liver, and only a fractional part

ABSORPTION IN THE LARGE INTESTINE.

An interesting feature in the large intestine is the marked absorption of water.

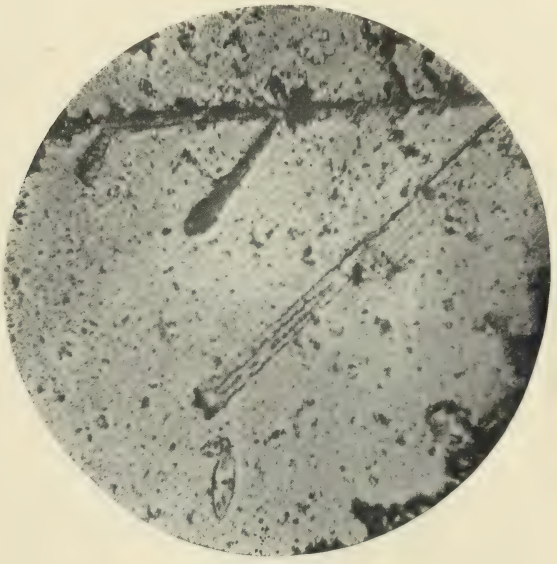


Fig. 2.

Salivary specimen.

Reaction: *Acid.* Sulfocyanates: 5.
Odor: *None.* Ammonia: 2.



Fig. 1.

Known salt.

$H(NH_4)_2CO_3 + CaCl$.

be really synthesized into the proteins of the body, or it is possible that the absorbed protein exists in the blood in some special form not as yet recognized.

In the small intestine, no doubt, water is absorbed in large quantities, but its loss is evidently made good by osmosis or secretion of water into the intestine, since

the contents of the ileocecal valve are quite as fluid as at the pylorus. In the large intestine the absorption of water is not compensated by a secretion.

The alkaline reaction of the contents makes a favorable environment for the growth of bacteria, particularly the putrefactive bacteria that attack protein material.

BACTERIAL ACTION IN THE SMALL INTESTINE.

Bacteria are constantly present in both the large and small intestines. Under normal conditions, however, it would seem that in the small intestine, only those bacteria capable of fermenting carbohydrate food show any distinct activity.

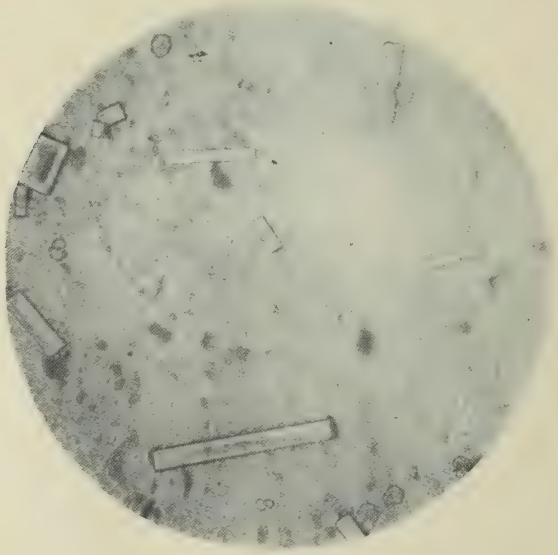


Fig. 4.

Salivary specimen.

Reaction: *Acid.* Sulfocyanates: 1.
Odor: *Ammoniacal.* Ammonia: 5.

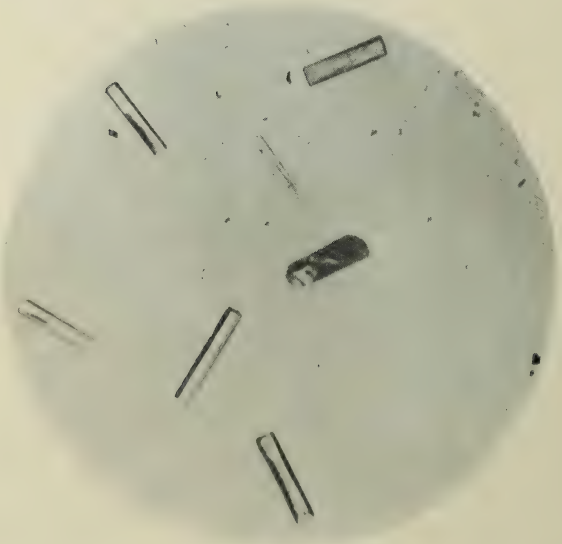


Fig. 3.

Known salt.

$(NH_4)_2SO_4$.

Putrefactive fermentation of protein material is limited or absent in this part of the intestine as long as the products of protein digestion are promptly absorbed. bohydrates gives rise to a number of organic acids, lactic, acetic, etc., and these acids inhibit the action of the protein bacteria.

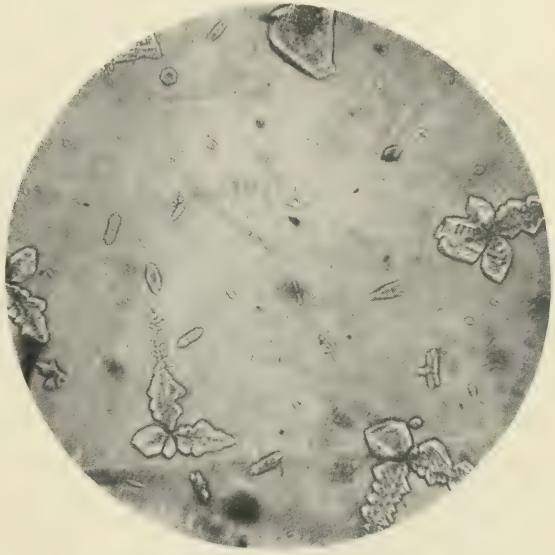


FIG. 6. *Salivary specimen.* (No chemical tests.)

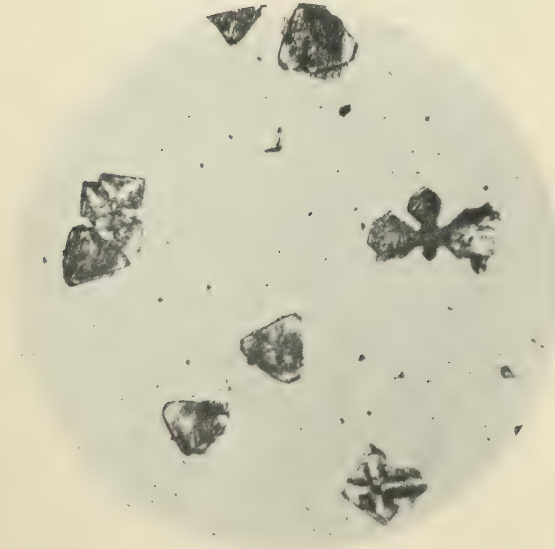


FIG. 5. *Known salt.* KCl.

It has been shown that the presence of carbohydrate material has a restraining effect upon protein putrefaction. The simplest explanation of this relation is that the fermentation of the car-

BACTERIAL ACTION IN THE LARGE INTESTINE.

In the large intestine protein putrefaction is a constant and normal occur-

rence. The reaction here is stated to be alkaline, and whatever protein may have escaped digestion and absorption is in turn acted upon by the bacteria and undergoes so-called putrefactive fermentation. The splitting up of the protein molecule by this process is very complete, and differs in some of its products from the results of hydrolytic cleavage as caused by acids or by trypsin. The list of end-products of putrefaction is a long one. Besides peptones, proteoses, ammonia, and the various amino acids, there may be produced such substances as indol, skatol, phenol, fatty acids, carbon dioxid, hydrogen, marsh gas, hydrogen sulfid, etc. Many of the above-named products are given off in the feces, while others are in part absorbed and given off to a certain degree in subsequent excretions.

Having briefly considered the chemical changes of foodstuffs during normal digestion and absorption, may we not call to mind briefly the chief inorganic salts of the liquids of the body? most of which occur in nature in the form mentioned, enter plants as such, combine very loosely with organic matter, and are largely excreted from the animal body also in the form of salts.

THE CHIEF INORGANIC SALTS IN THE LIQUIDS OF THE BODY.

In the liquids of the body the main salts are sodium chlorid, sodium carbonate, sodium phosphate, potassium, and calcium chlorid or phosphate.

They have most important functions in maintaining the normal composition and osmotic pressure in the liquids and tissues of the body, and by virtue of their osmotic pressure they play an important part in controlling the flow of water to and from the tissues. Moreover, these salts constitute an essential part of the composition of living matter. In some way they are bound up in the structure of the living molecule and are necessary to its normal reactions or irritability.

The special importance of the calcium salts in the coagulation of blood and the curdling of milk, as well as the peculiar part played by the calcium, potassium, and sodium salts in the rhythmical contractions of the heart muscle and the irritability of muscular and nervous tissues are well known.

Most vegetables contain a large amount of potassium salts, and in the blood these salts react with the sodium chlorid. Thus, if potassium sulfate were added to the blood, it would react with the sodium chlorid, giving some potassium chlorid and some sodium sulfate. Both these salts are supposed to be removed by the kidneys—since, except in minute amounts, they are practically foreign to the blood. This latter liquid will thereby lose some of its supply of sodium salt, thereby causing the natural craving for more in the food, which is often apparent.

This paper, with the microscopic slides, has been prepared as one of a series written for the sole purpose of studying the probable chemical changes of foodstuffs during digestion, with special attention given in an effort for the ultimate determination of the microscopical chemical elements found in the saliva.*

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* The accompanying photomicrographs are shown as being representative of one of the methods at present used in this effort, which has necessitated the preparing and studying of many hundred slides—including practically all of the chemical salts known to exist in the body tissues and fluids—as a means of comparison with those salts found in the saliva, relative to their characteristic form of crystallization as well as their similarity under examination with the microscope and polariscope.

The salivary specimens are supplied with tabulations of the simple tests for reaction and odor, also the drop test for sulfocyanates and ammonia, and are accompanied by a specimen of a known salt which bears many characteristics similar to those of the salts of the saliva.

In the chemical drop test for sulfocyanates and ammonia, a colorimetric scale is used (prepared from Dennison's colored tissue paper for shade guides), being numbered from 1 to 6, No. 1 being low and No. 6 high.

THE RELIEF OF PAIN DURING DENTAL OPERATIONS.

By GEORGE T. GREGG, D.D.S., Pittsburg, Pa.

(Read before the New York Odontological Society, at its regular monthly meeting, October 19, 1909.)

FROM the beginning of dentistry, we might say, the word dentist to the general public has been synonymous with pain. People come to our office and say, "Doctor, I have put off this visit as long as possible. I would rather do anything than go to the dentist. I can easily endure the pain of a surgical operation, but I cannot bear the shock of having my teeth filled." Mortifying expressions of this sort are familiar to us all. They bespeak a reputation of which we, as a profession, certainly cannot be proud. We read a great deal on almost every subject in dentistry excepting that of "the relief of pain," which I think is one of the most important. Think of the happiness that would be caused should some physical change take place in the human anatomy that would permit all dental operations to be performed without pain! Think of the nervous energy that would be saved, and of the great number of busy dentists there would be!

Pain has been our bugbear since we have given dentistry a thought; it has stood between us and thorough operations, has caused us the loss of nervous energy, has kept patients away from our office, and has prevented us from doing a great deal of good to humanity. Surely there are no arguments against the relief of pain in dentistry, yet it is surprising how few men bend much of their energies toward its elimination. The principal arguments put forth are: It takes too much time. My patients will not pay for it. My patients have confidence in me and think that what I am doing is correct, and therefore tolerate the pain without complaint. Some have even told me that it was a greater strain on them "to bother about relieving pain than it was to go right ahead and let the patient suffer; sharp burs and a light touch will accomplish all that is necessary." To me, this has always been a mystery.

GAINING THE CONFIDENCE AND EARNING THE GRATITUDE OF THE PATIENT.

Since the beginning of my dental career I have tried all means at hand to relieve pain, and my efforts have repaid me many-fold, not only in gratitude from my patients, but because I can do better work and shorten the sittings, thereby preventing strain on myself and saving my patients fatigue and shock. Patients leave the office, not in a state of dental fatigue, but generally happy in the thought that they can return and have the remainder of their work done without suffering. Patients whose teeth have been carried to the limit with gutta-percha and cement because they were not able to endure the agony of having the cavities prepared for permanent fillings, finding they are not to be hurt, will continue to come back until their mouths are in good condition; they are willing to allow me to undertake more extensive pieces of work. The old adage, "To do thorough work, you must hurt," should be reversed—"To do thorough work, you must not hurt." There is a very small percentage of patients who will undergo the pain of having a cavity thoroughly prepared along scientific lines.

Many inlays have failed from improper preparation, and not always because of the lack of knowledge. The operator, trying to avoid sensitive parts, depends too

much on cement adhesion instead of on mechanical anchorage as well as cement.

Gratitude. If you wish your patients to speak well of you behind your back, don't hurt them. If you want to have them heap abuse upon you, torture them while they are in your chair. Is it not a pleasure to you to have a patient leave your chair saying: "Doctor, that was grand! you did not hurt me!"? It partly pays you for the operation. On the other hand, think of the patient who remarks, "You almost killed me!" and who, whenever your name is mentioned, has unkind things to say.

You can do a beautiful piece of work and find that it will not be appreciated so much as are your efforts to alleviate pain. A filling at the gingival line on the buccal or labial surface will be pointed out with the remark, "My! oh my! how that hurt!" It may be a beautiful filling, but it is not the workmanship that is considered, but the suffering endured while the filling is being put in.

Dentistry at best is very trying, and a few words of gratitude once in a while make our lives happier. Every man who is inflicting pain undergoes severe strain, and in time that nervous strain will break down anyone, no matter how strong he may be. I have never been able to inflict pain without undergoing a strain. Many times I have lost sleep thinking of how I would excavate a buccal or labial cavity that could not be touched with an instrument without causing a wince. You all have had the same experience. There are patients whom you dread to see come into your office, because of the worry they cause you. These are cases in which we should be able to work without inflicting pain. They sap our nervous energy, put us in an irritable state, and send us home exhausted at the end of our day's work. If we can get through the day without such worries, we feel better, are happier, treat our patients better, and everything goes along smoothly.

MEANS OF INDUCING ANESTHESIA.

The days of trying to desensitize cavities with hot air and topical applications of caustic soda, carbolic acid, formalin, cocain, sprays, and especially with sharp burs, are about over; at least they ought to be. These means are not practical and cannot be used with success. Sharp burs are good things to have for rapid cutting, but even with sharp burs you cannot excavate sensitive dentin without inflicting pain. They will alleviate pain but very little, no matter how slowly you run your bur, or how delicate a touch you may have.

Cataphoresis has been tried, and found wanting. The rubber dam has always to be applied, and there are places where it cannot be used. Cataphoresis takes a great deal of time, the patient has to sit perfectly quiet, which is a great strain, and there is more or less pain connected with the application of the current; also you may cause the pulp to die. At times, even after a half hour's application, the cavity will not be desensitized. Cavities below the gum line, along the buccal surfaces of upper and lower third molars, are simply out of the question with cataphoresis. The different sprays, such as ethyl chlorid and the Van Wyck-Kerr ether spray, will desensitize a cavity, but not without a good deal of time and patience, and with more or less pain in the majority of cases. The apparatus and the disagreeable odor of the ether are very objectionable to the patient. I have made an effort to give a fair trial to anything new that I have heard of along this line, and have abandoned them all, except the high-pressure syringe and general anesthetics, especially nitrous oxid and oxygen—but never chloroform! To my mind, anyone who administers chloroform or permits a physician to administer it in his chair is very foolish, and takes a great risk. Every month you can read of a death by chloroform that occurred in some dental office. Why should we administer chloroform, which shows a death-rate of about one in three thousand, when we can administer nitrous oxid and oxygen, which has absolutely no death to its discredit?

Right here I want to recommend to you for reading Dr. Wm. H. DeFord's new book on "General Anesthetics in

Dentistry." No dentist who contemplates using a general anesthetic in his practice should be without it. He says: "Bold in other directions, commendably progressive in all that relates to manipulative ability and artistic development, the dental surgeon shrinks from anesthetics. He cuts living tissue, lacerating the nerves themselves, 'performing laparotomies upon the teeth,' so to speak, and the anesthetic usually employed is that of a witty speech or an amusing story, while the patient suffers, cringes, agonizes almost to the state of collapse. In this enlightened age no surgeon, except a dental surgeon, permits a patient to undergo, without an anesthetic, tortures equal in severity and duration to which one submits during the average dental operation."

Dr. Rhein recently reminded us that we as a profession occupy a unique position, inasmuch as we claim to have first introduced the benefits of general anesthesia by means of nitrous oxid, and yet today we find ourselves in the lamentable position of being subject to the criticism of the medical world because our work is so much dreaded and feared by patients. Dr. G. V. I. Brown said that if he should resume the general practice of dentistry, he would use nitrous oxid a thousand times where formerly he used it once.

NITROUS OXID AND OXYGEN.

The majority of dentists are averse to administering general anesthetics. They say, "I don't extract teeth, and have no use for a general anesthetic." Extracting is a small part of our practice. I do not average one extraction in a month, yet probably administer an anesthetic, nitrous oxid and oxygen, every day in my practice, principally for the excavating of sensitive cavities. This has given me more satisfaction, afforded me more gratitude from patients, and helped me out of more tight places than anything else during my experience in dentistry. It will do just the same for everyone who spends a little time in learning how to administer it. Nitrous oxid and oxygen can be used in any painful operation that comes under the head of operative dentistry, such as excavating sensitive dentin, exposing congested pulps, lancing abscesses, desiccating cavities, amputating roots, and extracting teeth. The results are always positive. If you get your patient in the proper state, you can be sure of painlessly excavating cavities that would otherwise not bear the touch of cotton.

The value of this method consists in that it is universal. First get the confidence of your patient; this is absolutely essential for success. Every man has his own way of doing this. If your patients believe in you you will have little trouble. If a patient presents for the first visit, I have found it a good plan to study him and get a good idea of the temperament with which I have to deal, before adopting any manner of procedure. If the patient has had some unpleasant experience with an anesthetic, allay his fears. Tell him that the anesthetic which he is to take is nothing like ether or chloroform, that there will be no bad effects, that it is perfectly safe, that he will not become unconscious, and will feel perfectly normal a few moments afterward. Show him that you are sincere in trying to relieve him from pain, and you will have little trouble. Once a patient has taken nitrous oxid and oxygen for the excavation of a sensitive cavity, your troubles with that patient will be over.

Never mention laughing gas to your patients. Generally they have heard some exaggerated story of laughing gas, and you might excite them more. If they ask what gas it is, simply say it is nitrous oxid and oxygen.

See that your patient is comfortably seated and can breathe freely; take the ordinary precautions; adjust the nasal inhaler, and tell him to inhale and exhale through the nose, till a peculiar feeling comes over him. Impress on him not to become alarmed at the odd feeling, that he must be in that state in order to get the proper effect. Have him inform you at the approach of the feeling and proceed to operate. If you cause pain, have the patient breathe in a

little more; very seldom will you need to let him become unconscious to accomplish the desired result. Have your patient keep his eyes open, reassure him by talking to him, and you can operate in this state almost indefinitely. Of course you must have an assistant to operate the gases; you yourself must devote your entire attention to your patient.

I have been using this method with very few exceptions, for three years. In that time I have had only two cases that I would really call failures, and only in two cases nausea was experienced. One of these was a young man to whom I administered the anesthetic for the accommodation of a surgeon, and whom I kept in an unconscious state with nitrous oxid and oxygen for one hour and twenty minutes, using three cylinders of nitrous oxid and one of oxygen. The patient had not been prepared for an anesthetic. In both cases the sickness was of short duration. Today I would be inclined to relinquish general practice rather than conduct it without the aid of nitrous oxid and oxygen.

A surgeon who had a serious operation to perform on a patient to whom he was afraid to administer any other anesthetic asked me to administer it for him in one of the hospitals in Pittsburg last July. I kept that patient under the influence of the anesthetic for about thirty-five minutes, for the removal of a cancerous growth around the kidney. The patient seemed perfectly rational before being removed from the operating table. Just a few minutes after the operation I spoke to him and asked him how he felt. The surgeon subsequently ordered one of these anesthetic apparatus, and just before I came away he performed two laparotomies, and was delighted with the result. Neither patient was nauseated, and both seemed perfectly comfortable.

One of the arguments against this method of anesthesia has been that you cannot get relaxation enough to operate on the abdomen; but this is not true. Dr. Teter has proved it, and the surgeon of whom I spoke came back to Pittsburg and performed these very operations.

GREAT ADVANTAGE IN HEATING THE GAS.

It has been proved that by heating the gas you can reduce the amount required for anesthesia from one-third to one-half; moreover, the patient takes it much more easily. I use the Teter outfit, which I think is the most complete. Dr. Teter recently reported 13,000 operations with nitrous oxid and oxygen, which is very different from nitrous oxid alone. I think the heating was first suggested by Dr. DeFord, who has been administering nitrous oxid for about twenty-six years, and has been using it in the heated state for about three years. The results are wonderful; the anesthetic does not irritate the patient's throat, he is more quiet, and the mixture is much more effective. The apparatus has four cylinders, and there is a bag of nitrous oxid on one side, and one for oxygen on the other. The gas passes into the bags from the cylinders, and from there into a mixing chamber in the center; from this mixing chamber it is breathed by a tube passing into the nostril. This copper tube is immersed in water at 120°, which is sufficient to warm it to the required degree.

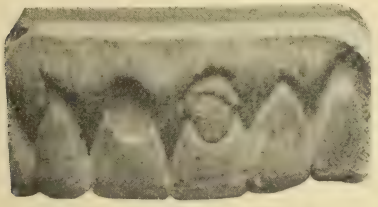
The Teter inhaler, which I generally use, is not in the way, and you can go ahead with the operation without paying attention to the inhaler. When I wish to excavate a labial cavity, or if a patient has a short lip, or cannot breathe freely through the nostril, I use a Clark Correct Inhaler. This inhaler is not often needed, but when you want it, you want it badly. It is a wise precaution to have a large supply of these inhalers at hand, to suit different cases.

REFERENCE TO CASES.

[At this point, various records from patients expressing their great satisfaction and pleasure at the use of this gas were read.]

The illustration represents a model in which there is a cavity away up under the gum, and from which a porcelain inlay, that had been put in by one of the oldest porcelain workers in this coun-

try, had come out. The only reason why the inlay came out was probably that the cavity was so sensitive that it was not sufficiently excavated. The patient feared the tooth would ache. I made an appointment, and after twenty-five minutes she left my office, with the cavity all prepared. She talked to me all the time while I was hurriedly preparing the cav-



ity—I was hurrying a little as I usually do in these cases—and she kept saying to me, "Now don't hurry, take your time; I feel all right." There was absolutely no discomfort to the patient.

Another case may be cited. A young lady's teeth had been temporarily filled with gutta-percha. She was afraid to have them excavated. When she came to me she was very nervous, but I gained her confidence by taking out under cocain anesthesia a small root which she had in her mouth. I proved to her that I could do that without hurting. Then I told her I would excavate a couple of cavities with the aid of nitrous oxid and oxygen, and I did so without hurting her. After that, I had absolutely no trouble. She had two weeks in which to get ready for going to college, and I did a lot of work for her in that time.

In another case, that of a young man, I inserted thirty-odd fillings. He was a comical sort of fellow, and he said, "This is a very attractive way of accumulating a jag with no hang-over!"

In one family, I gave the gas to the father, who was over sixty years old, to the daughter, and to both sons.

One lady wanted to be absolutely unconscious before she was touched. On the back of her record she wrote a little note, in which she stated that it afforded her great pleasure to fill out the blank, and that she could not find words to express the relief that nitrous oxid and oxygen had given her.

HINTS.

The high-pressure syringe is an instrument which, in my estimation, no dentist can afford to be without. There are many cases in which it can be used, especially in removing pulps in the preparation of abutments for bridge work. It will save a wonderful lot of time for you, and will practically eliminate the pain. I have used it a great deal in the preparation of cavities, but have found nitrous oxid and oxygen more practical for that purpose. It takes less time.

There are two items which I should like to emphasize, namely, the kind of pit to make and the kind of point to use. The first points which were gotten out were tapered so as to fit tightly in a hole drilled with a small round bur. Dr. Porter of Oil City, Pa., suggested to me the use of a needle without any taper, and a tapered hole in the tooth. This method has been a wonderful improvement over the straight-side hole and tapered needle. The square point cuts into the sides of the tapered hole and makes a perfectly tight joint, which makes it possible to apply much less force to keep contact. The point of the needle is the same as an ordinary hypodermic point, necessarily making the pit small.

RIP VAN WINKLES IN AMERICAN DENTAL COLLEGE FACULTIES.

By EUGENE S. TALBOT, Chicago, Ill.

"Asleep in the lap of legends old."—JOHN KEATS.

TWO incidents of dental college teaching that have occurred lately have suggested the subject of this paper. Like the celebrated sleeper, Rip Van Winkle, dental college teaching faculties are asleep to the urgent and necessary education of the dental student. The needs are so glaring and the teaching so lax that even first-year students notice the deficiency, and have called attention to the condition. What is to become of the future stomatologist if the dental college faculties remain in their Rip Van Winkle stupor?

A dental college faculty went to sleep at the beginning of the fall course and did not awaken to the fact that students were not getting instruction in anatomy until the following February, when the students themselves called their attention to it. Some of the faculty, with eyes blinking, began to "sit up and take notice." The anatomy teacher was still asleep. On being aroused after some difficulty, he began his course (at that late period) upon the bones. When the students began to look about for bones in order to study and follow him, not a skeleton or even a skull was to be found in the college. Is a student to be blamed for his dental ignorance when the very structures which he is to treat after graduation are not furnished him?

In another college, a student said he had dissected the upper and lower extremities last winter. On asking him the origin and insertion of muscles, he informed me that he had had no lectures on the bones and therefore knew nothing of it—so another teacher on anatomy is sleeping.

In some dental schools the students lose from twenty to forty per cent. of their time. This time is wasted because the teachers have not so arranged their studies that all the time from eight in the morning to six in the evening is occupied, as is the case in medical schools. Would it not be a good plan to utilize all the time of the present three-year course before adopting another year?

A teacher of dental pathology for many years, with his wife, called upon me last summer on their way across the continent. I naturally asked after their health. The doctor said (both were over seventy years of age), "My wife has been suffering a number of years from a variety of rheumatism in which the mouth and teeth are not involved." Strange as it may seem, examination of the mouth showed the alveolar process and gums absorbed so that one-third of the roots of the teeth were exposed. He was oblivious to the fact, and evidently has been sleeping many years. His thoughts were those of the past. Present scientific advancement is to him an unknown quantity, therefore he is ignorant of the latest pathologic researches in regard to the systemic effects of disease upon the alveolar process and gums.

The damnable practice of spreading the dental arch, indiscriminately, without extraction cannot be too severely dealt with. Operators who do this have no knowledge of the human body or that patients possess nervous systems. Suggestions fall upon desert soil, since they have been informed many times that all children with arrested and irregular jaws and teeth possess unstable nervous systems.

The teachers are asleep, and cannot be aroused to the sense of duty of specialists to patients; their interest is purely commercial. A case in point occurred last spring. A fifteen-year-old girl was brought to me in consultation by her parents. She was on the border of nervous prostration; could not sleep or attend school, and her appetite was faulty. She had been under the care of a first-class mechanic specialist for a long time to have the superior dental arch spread to allow the cuspids (still in the jaw) to erupt. About half the space required for their eruption was present when the appliance was adjusted. Nothing had been accomplished in the six months' treatment except that the incisors were brought anterior to their normal position, thereby causing a marked deformity of the teeth and lips. The money decided upon for doing this operation had been paid in advance. The operator, finding he could not accomplish what he had promised, now demanded one-half as much more money before he would continue the work; this was refused. When the patient came to me I found that even the appliances were a source of annoyance. I removed them and stated that it would not be necessary to replace them. I then dismissed her with the understanding that she was not to go to school, but to walk in the fresh air, expand the chest by deep breathing, eat plenty of nourishing food, keep her bowels open, and return to my office within a week. On her next visit I informed her that I would extract the first bicuspids and that was probably all that would have to be done, the articulation being normal. Nine months after the extraction of the teeth, at the present writing, the cuspids are erupting, and the incisors have returned to their normal position.

I have a record of twenty-seven young patients who have gone through similar experiences under the care of these teachers of mechanics. All have had nervous breakdown; some have been injured to such an extent that it will require years to recover health; some have been taken to the West and placed on ranches, others to sanitariums. These twenty-seven cases have come to my notice in one part of the country only. How widespread must be this pernicious habit throughout the country! and how many people must suffer thereby. Physicians who have treated such patients have called my attention to this brutal method of procedure, and have asked if more simple methods cannot be employed.

Why not operate in the interest and welfare of the patient, extract the first bicuspids, and save months and perhaps years of suffering? Plowing through dense bone by pressure and absorption is a pernicious habit and would not be tolerated in other branches of surgery.

The fourth period of stress, from twelve to eighteen, when new functions are taking place, represents one of the most important changes in life. The already unstable nervous system is doubly sensitive to nerve-strain at this time. The method of the correction of irregularities at this period by constant pressure tends to undermine the health of the patient. Realizing this condition of health and the constant strain incident to the correction of irregularities of the teeth, I instituted, many years ago, the surgical method of the removal of bone before the advancing tooth, thereby reducing the nerve-strain to a minimum. What objection is there to extraction of the first bicuspids and letting nature restore the cuspids to their normal position. The two teeth are not essential to health any more than the vermiform appendix, and can just as readily be disposed of. What objection is there to a surgical operation for the removal of the bone, thereby saving months of nerve-strain and misery? Only dollars and cents can be the excuse of the tooth carpenter and plumber for such a brutal proceduce. These teachers are asleep to more simple suggestions.

There is no one subject drilled into the minds of the student and ears of the profession more than that of the artistic effect of all dental operations. This basis is purely in the imagination of the mechanic, since the effect of the teaching upon the victim is anything but what should be desired. The artistic appearance of crown and bridge work, which

fills the mouth with bacteria and filth and against which medical practitioners are working, is one of these. To these bad and undesirable systemic effects the dental mechanic and plumber is oblivious.

This unhygienic condition of the mouth in its *artistic environment* contrasts well with the jaws and teeth. Rooseveltian style in jaws and teeth of a delicate individual possessing small features and whom the Almighty never intended to resemble a Halloween jack-o'-lantern, is due to the expansion of the dental arch without extraction. There are many of these neurasthenics and degenerates, walking the streets, who would have looked better in their original environment. I fear dental teachers are asleep in regard to art as well.

Another serious objection to the expansion of the dental arch without extraction, outside of the nerve-strain upon the patient and the inartistic effect of the teeth, jaws, and face, is the non-development of bone-cells to hold the teeth in position after they have become readjusted. The older the patient, the less liable are the cells to be deposited. Attention was called to this serious condition many years ago, but the teachers are still asleep. I have seen many mouths in which the teeth never became tight in their new position, and the alveolar process was partially or wholly destroyed. What is true of hypertrophy of the alveolar process in children's mouths with an unstable nervous system is also true of the opposite condition, *i.e.* want of deposition of bone-cells. "It is a poor rule that will not work both ways."

The mechanical pressure necessary to produce inflammation and absorption of the alveolar process is often so great that a restoration of the inflamed surface becomes an impossibility. The teeth, carried outside of the bony arch, are thus deprived of new bone-cells to construct the process about them. I have a record of forty-two patients in which the teeth remained loose from a want of deposition of bone-cells to hold them in position, and in which the roots of the teeth were exposed to a greater or lesser extent. Interstitial gingivitis is always present and occasionally pyorrhea alveolaris.

A single suggestion is all that is necessary to cause the medical profession to prove or disprove its value. If tenable, it is immediately adopted. By this process a working basis for medical research is thus obtained. Not so with dentistry; many facts discovered and brought to light twenty or thirty years ago have never been considered by teachers. The dental profession have no working basis nor have they a solid literature. Must the dental teacher be struck by lightning or knocked on the head with a club to be awakened to the sense of duty?

The dental literature is a barometer by which the teacher's knowledge of pathology and the receptive capacity of the student can be tested.

Within the past year I glean the following: According to a dispatch from the East, a teacher claims that small jaws and decayed teeth in New England are due to pie-eating. This is certainly a remarkable statement, since the proverbial caricature shows a child eating pie with very large mouth, jaws, and teeth.

If it be true that small jaws and decayed teeth are due to eating pie, how does he account for the large jaws and teeth which do not decay, also found in New England, and whose possessors eat pie. How does he account for other deformities of the head, face, nose, jaws, and teeth? It would be interesting to know how he would account for the small jaws and irregular and decayed teeth which are more numerous in the British Isles, where they do not eat pie but gooseberry tarts. Other teachers account for these conditions as being due to the finely ground flour from the Minneapolis mills. Why should these particular mills be the cause of so much misery? Why should not the flour ground in any American mill produce the same result? Again, why should the flour from any mill cause these pathologic conditions? An explanation is awaited with much interest.

Teachers are instructing their students this winter how to treat interstitial gingivitis and pyorrhea alveolaris by the ap-

plication of salves and ointments and with the use of from seventy-five to one hundred and fifty steel instruments, regardless of the fact that the disease may be due to local or constitutional irritations and infections. In many cases the instruments have done and are doing more injury to the alveolar process than the disease. Such a patient is now in my practice at this writing.

Last summer a teacher read a long paper on how deformed jaws and teeth were caused by inhalation and exhalation of air through the mouth. He failed to explain why such patients could not breathe through the nose, or how certain other deformities, always associated with these particular deformed jaws, such as asymmetry of the eyes, nose, individual teeth, face, ears, and other deformities of the body, are produced. The earmarks of commercialism and mechanism were noticeable throughout the entire article. The want of a broad knowledge of the subject was conspicuous.

A bright teacher on physiology in both a medical and dental school informs me that an indignation meeting was held this winter by the dental class, and a committee was appointed to wait upon him to inform him that "his course of lectures was 'way above them. They were not well enough educated to understand his lectures on physiology." It was not strange that such a statement should come from these students, since the class for years has, in a measure, been made up of rejected students from other colleges.

This incident is related to show the necessity of the dental student to first obtain a high-school education as a standard for entering the dental school, and secondly, the necessity of the student's taking the fundamental branches of medicine first before entering upon the dental specialties. The contrast between the more important branches of biology and those of the specialty are so great that the student neglects the former for the latter.

In discussing oral hygiene, one teacher suggests taking impressions of the mouth from time to time, and studying the plaster casts to note the progress of disease. Personally, I am sorry such a radical suggestion should be made at this particular period in the evolution of symptomatology. Back in the early Greek period, symptomatology obtained its birth. From Thales to Aristotle the suggestion of natural laws developed. These great philosophers wrested facts from natural conditions as they saw them. Combined with great freedom and a wide range of ideas, independence of thought, and tendencies to rapid generalization, they had genuine gifts of scientific deduction. From that time, through all the years to the present, physicians have improved their methods of diagnosis, until now the direct study of structures has become the requisite *par excellence* in the treatment of disease.

I hope and trust that so radical a departure as this, namely, the study of casts instead of the tissues themselves, will not be copied in medical journals, and thus upset the present well-established methods of treatment of disease. Think of studying plaster casts in the treatment of whoopingcough, pneumonia, typhoid fever, measles, gumboils, and piles.

Taking these incidents as a criterion for the average education of the present dental teacher, a very serious question arises, one that demands an immediate solution, namely, who are to fill the places of the present teachers in our dental schools? The teachers now filling the chairs are made up of men who have been teaching thirty to forty years. These teachers have not kept pace with the advancement of biology and pathology, the result of which is that the same courses of lectures are given today (see textbooks and papers read by the teachers before dental societies) as were given thirty years ago. Some of these teachers admit that they are not up to modern thought, and yet they do nothing to improve that defect. They are sleeping the sleep of Rip Van Winkle. Many of these teachers will soon drop out. Their students have not advanced, nor are they educated in modern thought. Who, then, are the men to fill these positions and bring the college teaching up to the pres-

ent standard of modern research? Already two of our dental departments of universities have begun to ask this question. In both instances they have canvased the country and have stated: "We are unable to find the men suitable for the positions." The graduates of today are narrow, uneducated men; the literature of today abundantly verifies this statement.

Medical schools have long ago made provision for these defects. Each fundamental branch of medicine is divided into departments with a head professor, six or eight assistant professors, and from six to twenty instructors. In this manner there is a uniformity of teaching, and a vacancy due to sickness or death can always be filled with well-trained and efficient men. In no other way can the ranks of our dental teaching faculty be recruited, and the sooner the teachers awaken to this fact the better equipped our dental schools will become. All new teachers entering the teaching faculty should be graduates of medicine from modern medical schools as well as graduates of dentistry.

Teachers in some of our best dental schools are alive to the fact that there is a dearth of good teaching material for all the dental colleges, and this brings us to another serious proposition. There are many more dental schools in the country than can possibly exist; at least one-third could go out of business and never be missed. Their principal method of securing students is to take the riff-raff discarded from the better schools. There was a time when to be a professor in a dental school gave the individual some prestige, and certain ambitious individuals were willing to furnish the money to keep a school alive. That period has passed. Only such schools as are actual departments of universities and properly equipped can exist at the present time; only such schools will draw the best students. The demand for students is not so great, but a better education and better teaching faculties are necessary to equip the student for practice. The poorer schools must give up the struggle, just as the poor medical schools are doing. As long as dental schools are owned and managed by individuals who are working them on a commercial basis, we cannot expect much improvement in proper methods of teaching, or that the interest of the student will be subserved.

The ambition of certain teachers to control and operate a dental school regardless of the results is nicely illustrated in a new undertaking in Tennessee. A well-meaning man and a good teacher has organized a dental school with the hope of eventually adding an academic department, a law department, and a medical department. By this method, he hopes eventually to form a new university. It is a difficult proposition for a group of men to organize a dental school at the present time. That one man should attempt not only to do this but to corral an academic, law, and medical department within the confines of a university enclosure is certainly an herculean task. All this in the face of the fact that there are already seven or eight universities in the state! Already a so-called medical department of a university has become bankrupt, and more are likely to follow. There are three dental schools in the state, one of which is eking out a miserable existence. All that the new school can expect to do is to receive uneducated and discarded material from other schools. It is high time that the national organization awakened and placed a higher standard upon the requirements for organization of new dental schools. That a dog can wag a tail is generally conceded, but that a tail (in this case a poor one at that) can successfully wag a dog is hardly to be expected.

It would seem that a new era is about to dawn. The teachers are waking up to the realization that radical changes are necessary. At the last meeting of the National Association the song-books were left at home; not a swan song was sung. The sessions were conducted in a thoughtful manner. Considerable progress was made when they adopted a unanimous resolution that a high-school graduation or its equivalent should be required for a future entrance into the

dental schools. Such a requirement, however, avails little, since the quality of teachers who are to instruct these better educated candidates will soon draw the student down to the very level of those who are now being graduated. It is to be hoped that at the next meeting of the national organization a resolution will be passed requiring all new teachers of biology entering dental schools to possess an academic and medical as well as a dental degree.

DRUGS AND THE DENTAL PROFESSION.

By Dr. LYMAN F. KEBLER,
CHIEF OF DRUG DIVISION, BUREAU OF CHEMISTRY, U. S. DEPARTMENT OF AGRICULTURE.

(Read before the union meeting of the Maryland State Dental Association and District of Columbia Dental Society, October 28, 1909.)

I CONSIDER it a privilege to be given an opportunity to say a few words on the subject of drugs, or medicines, used not only by the medical profession but largely also by the dental profession. I must confess that we have not given purely dental medicines as thorough a consideration as they deserve. Your profession probably has no idea of the immense field we are compelled to cover in our work under the Food and Drugs Act. I can recall only about a dozen products which are specifically dental, or used chiefly by the dental profession, that we have actually examined.

IMPORTANCE OF EFFICIENT DRUGS.

It is my opinion that if your patients were asked to vote as to the quality of drugs to be used by their dentists, whether they should be of the highest quality or not, if by the highest quality they would be relieved from suffering in the dental chair, they would be unanimous in voting for the highest quality of drugs. The success of the dentist is dependent not only upon his skill, mechanical ability, and ingenuity, but also to a considerable degree upon the quality and character of the agents he employs. For example, if he is prone to accept the statements made by certain advertisers that this antiseptic or that medicinal soap will do this or do that, he may be misled absolutely, and in so doing may unwittingly infect an innocent patient. He may depend on a so-called antiseptic soap to properly cleanse his hands, when, as a matter of fact, that antiseptic soap is worthless so far as its antiseptic value is concerned, having no more antiseptic qualities than the ordinary laundry or toilet soap.

FRAUDULENT DRUG ADVERTISEMENTS.

We recently examined one of these so-called medicated soaps which is very widely advertised in the United States, and found that it was nothing but an ordinary common cheap toilet soap colored, without any material medicinal properties whatever. When the proprietor of the product was cited to show cause why action should not be taken against him for misrepresentations of such a character as are almost daily appearing in the papers, he admitted that the soap did not contain any material amount of antiseptic properties in addition to that of any other soap, but that the quantities added are purposely small, homeopathic, if you please, "so as to make the soap mild."

Previous to the enactment of the Food

and Drugs Act there was little to deter adulteration, sophistication, or misrepresentation of dental drugs, excepting the deterring effects and influences of societies of the character represented here tonight, and possibly the good influence of a strenuous practitioner here and there. The various lines of advertising that appear in the papers foster bad medicines, bad practice, in fact everything bad. It is only too true that the newspapers are a potent factor for good or evil, and no one realizes this more than we do. I am digressing a little from the subject, but you will pardon me if I use just one illustration to drive this point home. Some time ago we had a case of a so-called cancer cure up before the Post-office department. It was Radol. I suppose you have seen it advertised in the papers. If you have, you will recall the picture of a man holding up his hand, with the legend, "I can cure cancer." We made an examination of Dr. R. DuPuis, alias Dr. Rupert Wells, the promotor of Radol, and his charlatan methods. He claimed that his product was radio-active. He was trading on the lauded medicinal properties of radium. We found that he was selling two mixtures, consisting principally of water, one containing a little quinin sulfate, acidulated, so as to impart to the preparation a slight fluorescence, which is held out to prospective patients as being due to the presence of a radio-active agent; the other mixture contained, in addition to the water, a small quantity of alcohol. These two preparations were sent to all comers for the treatment and positive cure of all forms of cancer, for the small sum of fifteen dollars! The treatment did not contain any more radium or radio-activity than ordinary tap-water. It was a very laborious case; one of the longest I have ever attended. The opposing side put up a strenuous fight, but we were successful in the end, and a fraud order was issued against him; then we finally succeeded in getting a criminal case under the Food and Drugs Act, and the gentleman is now out of business. After the business had been declared fraudulent by the postal authorities, we tried to get the fraudulent feature taken up by the newspapers, but I recall only a single one that would touch it. The Associated Press held aloof from it as from poison. I do not wish to censure the press, because it is doing a great good, but in these things it is erring, without doubt; it is fostering fraudulent schemes, not only in this particular "cancer cure," but in many others that I could mention.

THE FOOD AND DRUGS ACT OF JUNE 30, 1906.

The Food and Drugs Act was passed June 30, 1906, becoming effective January 1, 1907. The law regulates the manufacture and sale in the District of Columbia and the territory directly subject to the United States, and forbids the shipping into interstate commerce or the importation of adulterated and misbranded drugs. In addition to forbidding the importation of adulterated and misbranded drugs into the United States, it forbids the entry of any article which may be deleterious to the health of the people of the United States, or any article which is restricted in sale, or forbidden in the country of origin, exportation, or production. That gives the authorities a very powerful lever to keep frauds out of the country, and we are trying to do it. The getting into proper working order of the force appointed to put this law into effect was no small task. We were unable to get the proper force to put the drug portion of the law in operation by January 1, except in a few minor details, but about July 1, 1907, we began the work by placing competent chemists and inspectors in the port of New York. The port of New York, I might say, is the place where approximately 90 per cent. of all drugs imported into the United States are entered. We began our work gradually but firmly.

INSPECTION OF FOREIGN IMPORTED DRUGS.

I wish to call attention to a few of the articles met with which are simply typi-

cal, referring first to the imported products and then taking up the domestic ones.

It was soon apparent that some of the articles imported into the United States were far from satisfactory, far from the standard prescribed by the pharmacopeia, or the standard under which they were offered for importation.

ACONITE.

For example, a number of consignments of aconite root, one of the drugs largely used by the dental profession, were undoubtedly spurious. We simply would not permit their entry.

ASAFETIDA.

Another commodity that is used, according to your dental therapeutics, to a minor extent probably, is asafetida. Probably no drug has given rise to more ill feeling on the part of the trade, because the department enforced the law in connection with this particular product. The pharmacopeia specifies that asafetida shall contain at least 50 per cent. of alcohol-soluble material and not more than 15 per cent. of ash. The shipments that were offered for importation, exclusive of those that were of proper quality, which were comparatively few, varied in alcohol-soluble material from 10 to 30 per cent., and the ash content would vary from 45 to 80 per cent. Taking one of those products containing approximately 10 per cent. of alcohol-soluble material, which represents the valuable portion of the asafetida proper, you can readily understand the medicinal value that would be imparted to a medicine in which such an article was used. It would probably be equivalent to the ordinary placebo pill used by the medical profession. Possibly the slight odor would do as much good as the placebo pill.

I have bought a number of those spurious, debased, and inferior drugs, such as spurious aconite root of Japanese variety, and asafetida.

BELLADONNA.

Belladonna root and belladonna leaves were also commonly adulterated, the root with poke root and scopolia root and the leaves with poke leaves and scopolia leaves. When we first began the work there was hardly an importation of these two drugs that was not adulterated. A large number of belladonna-root shipments contained a considerable portion of poke root and other foreign material, and every possible effort was made on the part of the shippers to bring these inferior goods into the United States. It was often represented to us that if the proper quantities of belladonna root were used, in making a plaster for example, the medicinal properties would be imparted to the finished product, irrespective of what else might be present. The importers seemed to forget that the adulterant present might seriously affect the medicinal properties of the commodity which is prepared from such an adulterated product. Despite the strenuous efforts made to bring these products into the United States we were firm, and would not let them come in. For the past year we have not had any trouble. The belladonna root and the belladonna leaves are of proper quality when brought into the United States.

SARSAPARILLA.

I wish to call attention to another drug in regard to which fraudulent efforts have been made, namely, our ordinary sarsaparilla. I do not know whether this concerns the dental profession materially or not, nor to what extent some of these drugs are prescribed, but I find that most of them are described as dental therapeutics, so I cannot go far astray in referring to them. The pharmacopeia prescribes that the root shall be used in making the several sarsaparilla products, but the rhizomes shall be discarded. The rhizome is the top portion to which the roots are attached. The sarsaparilla proper was imported into London from other sections of the world, and there the roots were chopped off the rhizomes, and

the rhizomes repacked and shipped to the United States as sarsaparilla. We found them up in New York clamoring for entry, but would not let them in. We held that anything that is not good enough for England is certainly not good enough for the United States.

SENNA.

Another commodity of a little different type is senna sweepings and siftings. Senna is used, I might say, as the principal if not the most active agent in compound licorice powder. Senna sweepings and siftings containing dirt and foreign material of every conceivable character, some containing sand to the extent of 35 per cent., were offered. Senna sweepings are a very cheap article, being the refuse of large warehouses. It was held by the importers that it did not make any difference how much sand or other foreign material some of this senna contained, as it all went into general merchandise, and nobody would be the wiser. We held that inasmuch as senna was a valuable medicinal agent, and as it formed such an important part of so many preparations, it should at least be of respectable quality. We held that no senna siftings containing as much as 35 per cent. of sand and additional foreign material could be used in this country in the manufacture of compound licorice powders, which are so commonly used, not only by adults but by our children. A gentleman having one of these consignments particularly at heart came down to see me at Washington with an attorney, and I put this question to him: "You are a married man, are you?" "Yes." "You have children?" "Yes." Then I said, "I have one thing to say to you. That product is used in the manufacture of such and such an agent, which is used largely as a laxative for children. Now, let me ask you this one question: 'Would you be willing to have an article containing 35 per cent. of sand fed to your children?'" He grudgingly answered, "No." Then I told him, "Well, neither do the rest of us." The importation was not permitted entry into the United States.

ESSENTIAL OILS.

Essential oils is another class of preparations I want to refer to. We have had considerable trouble with these oils, which are used in your profession as antiseptics to a considerable extent. One of them in particular has given us considerable concern, and that is oil of cassia, which is adulterated and contaminated to a considerable extent with lead. The federal law does not extend to articles intended for the arts. For example, it would probably be very difficult for the officers to deny entry to oil of cassia which is intended to be used as a flavoring agent for soap, irrespective of the fact that it was adulterated or contaminated with lead. The expedient resorted to by the dealers importing these products is to mark them "not for medicinal use" or "for technical purposes only." It was found, however, that articles so marked found their way into interstate commerce, and I little doubt but that the dental profession is buying oil of cassia in packages marked in that way. If you want to use an article of that type, that is, oil of cassia contaminated with lead, I would advise you not to scrutinize the labels. If, on the other hand, you are careful, and do not wish to put a lead-bearing product in your patients' mouths, I would advise you to carefully read the labels. We cannot prohibit the shipping into interstate commerce of an article of that character when it is properly marked, because that complies with the law, at least technically.

EXAMINATION OF DOMESTIC DRUGS.

While we were examining imported products, domestic drugs were not forgotten. We well knew that the imported drugs sooner or later found their way into interstate commerce, at least part of them, and we thought that the best results would be obtained by restraining the importation of inferior and debased

drugs; in other words, we thought to begin at the fountain-head rather than be compelled to seek them out in the multitudinous channels of trade.

POWDERED DRUGS.

We purchased, however, a considerable number of the powdered drugs on the market and began examinations. We were very well acquainted with the fact that powdered drugs lend themselves particularly to adulteration, and we soon found adulteration; for example, powdered ipecac root and belladonna root, in the same consignment, were diluted with powdered olive-pits, which is an ingenious, clever adulteration, to be discovered only by the use of a microscope. Another sample was found to be gentian, adulterated with a peculiar fibrous material, the nature of which could not be ascertained at first, but which in time developed to be nothing but powdered peanut shells, a very interesting adulterant and no worse than olive-pits.

For the benefit of our friends from Baltimore, I want to relate just this incident, because it is very interesting. There is no law in Maryland to intercept a practice of this character. As I was passing through one of the large houses there, I asked questions about this and that, and observing a large pile of full bags, I asked, "What is that pile of bags yonder?" The gentleman was rather reluctant in making reply to my question, but finally he said, "That is powdered olive-pits." "What do you use it for?" "Used in diluting pepper." I said, "You cannot send such pepper into interstate commerce." He said, "No, but we can give it to our own people in this state."

ANESTHETICS.

Anesthetics probably play as large a part in the dental profession as any sort of medicinal commodity that I can think of. Nitrous oxid is of course the most important, and as far as we have been able to determine, is of good quality. The reason for this is that, probably because of its nature, it is restricted in manufacture to a few firms who exercise care, knowing the dangerous element of foreign agents and having at heart the welfare of the public, as well as that of their pocketbooks. There are a number of anesthetics, however, which we have examined with interesting results. For example, several mixtures are sold consisting of various agents, such as ethyl chlorid, ethyl bromid, ethyl iodid, etc. One of the merchants interested in these commodities was apparently very much annoyed at the progress which his competitor was making, and he complained bitterly because we did not attack that competitor. He wrote us some very forcible letters, and we finally decided not only to examine the goods complained of, but the complainant's article as well, with the result that neither of them was what it was represented to be. Both these men have been given an opportunity to explain the misrepresenting and adulterating of their products. The man who complained to us will hardly be so perniciously active the next time, or at least he will be certain about his own goods!

SYNTHETIC DRUGS—ACETANILID.

So-called synthetic chemicals have probably been used to fool the medical, pharmaceutical, and dental professions as no other agents have ever been. Acetanilid is or has been used by all three professions quite commonly, particularly in the form of various headache mixtures, exploited under various euphonic names. There are a large number of well-known commodities on the market which are simply mixtures, but from whose names one would infer that they were simply synthetic chemicals. I think it hardly necessary to give names to this audience. Before the law went into effect it was impossible to learn definitely what the chief active ingredients of these commodities were. In fact, many manufacturers would change the active agent or agents from time to time, as was clearly brought out when this law went into effect. Before the law became effective most of these preparations contained acetanilid as the chief agent, but this agent was sur-

reptitiously replaced by phenacetin, because some labored under the delusion that phenacetin was immune. In this they were mistaken, and now a number have gone back to acetanilid because it is cheaper. One point to which I desire to call attention is the fact that unless the prescriber has knowledge relative to the main agent present in these preparations, he may be prescribing a commodity under one name which may be producing deleterious results, unfavorable symptoms, and improper effects, and then change the prescription and unwittingly give the same agent under another name. For example, on prescribing orangeine, undesirable results are developed, such as bluing of the nails, lips, skin, etc. Then another mixture of the same or similar constituents is prescribed, with worse results, exemplifying the proverbial jumping from the frying-pan into the fire. During the past year we have made an investigation of the pernicious action of articles of this character, and were astonished to find a large number of poisoning cases that have actually occurred as the result of the use of articles containing acetanilid, antipyrin, and phenacetin. Several bulletins on this subject have been published by the Department of Agriculture, namely, Bulletin No. 126 of the Bureau of Chemistry, entitled "The Harmful Effects of Acetanilid, Antipyrin, and Phenacetin," and Farmers' Bulletin No. 377, entitled "Harmfulness of Headache Mixtures." In these you will find incorporated the observations of a considerable number of physicians, and the cases reported in literature. The total sum of poisoning cases reported was 1669, that of deaths due to these mixtures, 55; that of habitual users, 169.

ANTISEPTICS—HYDROGEN DIOXID.

Before closing, I want to speak of another class of preparations, the antiseptics. The antiseptic that probably is used more generally than any other is hydrogen dioxid. When the law went into effect we purchased quite a number of the various brands on the market and made a study of them. Most of them were found to contain acetanilid as a preservative. It is frequently represented that the various brands of hydrogen dioxid do not keep very well. We found, however, that there was very little difference in the keeping quality of the majority of them during the first six months. After that certain ones deteriorated rapidly. Upon reviewing several dental books on therapeutics, I find that glycozone is described as a mixture of glycerin and hydrogen dioxid. It is also represented that these two ingredients must be very pure, else secondary products will result, such as formic acid, etc., which are very deleterious to the tissues. It was further claimed that this product, glycozone, liberated ozone in the stomach. As a matter of fact, glycozone is a simple mixture of glycerin and glyceric acid, and the most vivid imagination could not conjecture a condition in the stomach under which one iota of ozone would be liberated. Similar claims and representations concerning other remedies will be found in dental textbooks. A progressive man or student must certainly hold such books in high esteem! It is the worst form of quackery—certainly useful information in laying the foundation of future ethical men! Some of these write-ups look like paid advertisements. They are based upon the statements promulgated and distributed by the manufacturers. As a matter of fact, these representations are false, deceptive, and misleading to a degree.

A DENTAL COUNCIL ON PHARMACY AND CHEMISTRY.

I want to say a word relative to the work of the Council on Pharmacy and Chemistry of the American Medical Association. I believe that if the dentists throughout the United States could in some way form a body similar to the Council on Pharmacy and Chemistry, articles of the character above mentioned and referred to in text-books would have to go. Many of the manufacturers of these preparations cannot be reached by the federal Food and Drugs Act. The

medical profession is doing just this kind of work, the Council on Pharmacy being able to inform and advise the medical profession relative to these fraudulent representations. The dental profession is also encumbered with a considerable number of suggestive euphonious names which are applied to mixtures of well-established agents. Such names, in my opinion, should be eradicated. They seem to be analogous to the horde of names applied to headache mixtures, and are found in dental books to a considerable extent. Such undesirable names have been eradicated to a considerable degree from the text-books of the medical profession, and such as have not been should be and probably will soon be eradicated.

It seems to me that the two societies assembled here could do nothing more commendable than to start the ball rolling in the direction which I have indicated, and thus eliminate from their armament products which are at present a reproach to the profession.

THE DENTIST AND THE LAW.

By JOHN I. DEVLIN, Esq., Providence, R. I.

(Read before the Northeastern Dental Association, Providence, R. I., October 8, 1909.)

BLACKSTONE'S definition of the law is: "A rule of civil conduct prescribed by the supreme power in the state, commanding what is right and prohibiting what is wrong." This definition has been much criticized, Chitty amending it so as to read "commanding what shall be done or what shall not be done," and Stephens omitting altogether the latter clause of Blackstone's definition—Chitty and Stephens feeling, evidently, that the supreme power in the state did not always command what was right and prohibit what was wrong. A better definition is that of Bouvier: "The rules and methods by which society compels or restrains the action of its members."

We, in this state, and in many of the United States, particularly in the original colonies, are governed by the written and the unwritten law, the former being the statute law enacted by the state legislature and by the national Congress, and the latter being common law, which has for its foundation the decisions and the customs of the courts of England with which our forefathers were familiar and in sympathy, and which they brought to these shores. Of this warp and woof the courts of the different states and of this republic, by their decisions, have woven that fabric of doctrines and principles distinguished from the statute law and called common law.

The law-making bodies in a state are the legislature and the courts, the legislature creating the written law and the courts upholding and enforcing the common law and interpreting and enforcing the written law.

All are equal before the law, the rights of each individual being no more than the rights of every other individual.

Dentists, as dentists, and dentistry have received special attention from the law. It is required that each dentist, before he is permitted to practice the profession in a state, shall be examined as to his knowledge and skill; if he possesses the necessary degree, then he may invite the public for treatment. This is designed for the protection of the public from unskilful operators. The dentist may feel that he is unnecessarily restricted by the law in this respect, but

as the law assures to the public a competent dentist, so does the same law assure to the dentist skilful physicians and competent lawyers.

Quite recently, in this state, it has been ordained that no person or corporation owning or carrying on a dental practice and employing persons shall permit such employees to practice dentistry unless they have passed the examination and are registered. This was a wise provision of the legislature, for it works to the benefit and advantage of the practicing dentist. It distributes the patronage of the persons requiring treatment among only those who are entitled to practice. It reduces the business of the incorporated dentist or dental company, which previously had been attended to by unqualified practitioners, and spreads that business among the qualified. Then, too, it protects the dentist from liability in negligence cases, for unquestionably a qualified dentist is more skilful than one who is not, and the master being liable for the negligence of the servant, the employer who permits his unqualified employee to practice on the master's patient is liable for the negligence of that employee, and with this law enforced, the master would perform the service himself, with a small chance of improper work. Indeed, previously to the passage of this law, a client of the speaker recovered damages against a dentist who permitted one unqualified to work upon the plaintiff with terrible consequence, and the fact that one unqualified had performed the service went a long way toward convincing the jury that the dentist was negligent.

The United States Court has decided in a negligence case, upon facts similar to these, that the plaintiff should have punitive damages in addition to what the law usually allows, with a view to punishing the dentist and preventing a recurrence of the wrong.

The legislature looks upon dentistry as important and necessary to the community, and it should be so. The mouth, the throat, and the whole oral cavity are the doorway by which life is fed to humanity. All substances excepting air, if that be a substance, if they enter the body naturally, must do so through the mouth. I am told that nearly every disease germ enters the body by this avenue; that this is the natural receptacle of the organisms which aggravate most of the ills that flesh is heir to. Truly, then, the public should be safeguarded insomuch that only those who know how should be permitted to explore this all-important organ. Not only should the law guarantee the public that the dentist knows how, but the law should see to it that he uses his know-how in his practice. Scientific knowledge beyond dentistry is involved in the treatment and care of the mouth; many dentists possess this knowledge, many do not; those who do, have a select class of patients; those who do not have this knowledge must necessarily meet in their practice the great masses of the people, who with their limited finances cannot engage the services of the best-equipped—and these masses cannot in other ways so thoroughly protect themselves from the ravages of disease. These masses should be zealously watched over by the law, and where a dental practitioner has not as well a knowledge of bacteriology and immunity, his establishment and his work should be subject to the inspection of a proper commission, who would see to it that his office was sanitary, his instruments properly sterilized, and his patient antisepticized. This does not mean that the commission should be steadily present at the elbow of the dentist, but that they should unexpectedly look in upon him, observe his treatment, instruct and suggest to him, and see to it that these instructions and suggestions are heeded. The sanitary dentist would have nothing to fear from such a commission; the unsanitary would be brought up from sloth, the profession of dentistry would be elevated even higher than it is, and the public would be saved much risk. Such a commission should be composed of persons having the necessary dental and medical education, and a lawyer. The lawyer's services would be valuable in properly advising the commission, and in hearings on complaints against the of-

fending dental practitioner. The lawyer is suggested for a place on the commission because of the experience and observations of lawyers in hearings before boards or commissions possessing no knowledge of the laws of evidence. The value of testimony has been analyzed and separated to a precipitate which is the wisdom, learning, and judgment of the great law-writers since the law's beginning. These commissions, lacking in knowledge of the law, admit rumor, hearsay, slander, and scandal as evidence in their tribunals, to the amazement and aggravation of the lawyers present; justice miscarries, and wrong and not right prevails.

So much for the written or statute law concerning the dentist. Entering the realm of common law and its application to the dentist, we find that the laws of centuries controlling practice and the relations between physician and patient, and surgeon and patient, are applicable to the younger profession, namely, dentistry, so that the law for and against the physician and surgeon is the law for and against the dentist.

Pre-eminent in the cases at common law in which the dentist is involved are suits against him for malpractice and negligence, and in suits by him for services where the defense is negligence or malpractice in the services he has rendered.

A physician, surgeon, or dentist who undertakes the treatment of a malady or injury impliedly represents that he possesses, and the law places upon him the duty of possessing, that reasonable degree of learning and skill ordinarily possessed by physicians, surgeons, and dentists in similar localities with similar opportunities for practice; and he is chargeable with malpractice when he fails to use his best judgment in applying this knowledge and exercising this skill in the treatment of a patient.

A physician, surgeon, or dentist is not required to possess that extraordinary learning and skill which belong to a few men of rare endowments, but rather the learning and skill possessed by the average member of the medical or dental profession in good standing, and this is to be determined by the state of the profession at the time.

The physician or dentist is bound only to exercise reasonable care and diligence in the application of his knowledge to a particular case, and not the highest possible degree of care, unless he holds himself out as a specialist in the particular disease or injury or service, and then he must bring to the discharge of his duty that degree of skill and knowledge ordinarily possessed by those who specialize upon that special branch.

In the absence of an agreement to the contrary, the employment of a physician, surgeon, or dentist, continues as long as professional attention is required, or until the employment is ended by the assent of the parties or dismissal. The physician who engages to attend cannot cease his service while it is needed, unless he gives timely notice to the patient, so that another may be employed. If he ceases his services too soon, or if he absents himself from the case, he will be liable for malpractice. We have a case of a surgeon attending a fractured arm, who properly set it and told his patient he was going upon a ten days' vacation and directed the patient to keep the arm in a sling. He remained away five weeks, the arm slipped in the meantime, and became permanently united. The physician was held liable for malpractice.

The physician, surgeon, or dentist is not an insurer that his treatment will be successful and is not liable for an honest error of judgment, unless he has expressly guaranteed to cure. The practitioner who departs from the established and accepted mode of treatment does so at his peril, and no matter how good his intentions were, he would be liable if the results are injurious; and it does not relieve the physician, surgeon, or dentist from liability if it is a fact that his services were rendered gratuitously. The practitioner must properly instruct his patient as to what to do pending further personal attention, and is liable for failure to so properly instruct. The practitioner is liable for the unskilful assistance of his servants.

In the case of a partnership, under the familiar principle at the basis of all partnership liability, the negligence of one is regarded as the negligence of all the members of the firm, and all will be liable.

The malpractice or negligence complained of must have been the direct or proximate cause of the injury in order to entitle the patient to a verdict. This doctrine is forcibly put in an Ohio case where a physician, while performing an operation, broke a needle and lost a part of it in the patient's body, where it was subsequently found by another doctor operating on the same patient for a trouble which could not have been caused by the lost needle-point. The court held that inasmuch as the broken needle did not cause the trouble, the first surgeon was not liable.

The principles of the laws of negligence are the same in a suit against a physician—and you all are regarded as physicians—as they are in a negligence suit against a common carrier or manufacturer. To entitle the plaintiff to prevail he must show, first, that the practitioner was negligent; second, that his negligence caused the injury; third, that from the injury flowed damage, and fourth, the patient must show that he did not in any way, either by disobeying instructions or other carelessness on his part, contribute to the injury from which he suffers. In other words, the plaintiff must show himself free from negligence and show the defendant guilty of negligence; if both were negligent, the plaintiff cannot recover damages. Even if no instructions are given by the practitioner as to care, the patient must exercise ordinary prudence and care.

A physician, surgeon, or dentist is liable in an action for negligence if he communicates an infectious or contagious disease. He is called upon by the law to exercise his knowledge of such things, and he must take the recognized precautions against the carrying of such disease from one person to another, or from himself to another. A case on record in New Hampshire makes the surgeon liable for the infection of the patient's wife, who assisted in dressing a wound at the request of the surgeon, who negligently assured her that there was no danger, she relying upon his advice.

The practitioner is liable for the consequences attending upon the issuance by him of a wrong prescription, and in such case there is no duty of exercising care put upon the patient. If the practitioner uses an anesthetic and thereby deprives the patient of the use of his faculties, the highest professional skill and diligence to avoid any possible danger must be exercised by the one who administers it. He is only bound, however, to look to natural and probable effects, and is not answerable for results arising from the peculiar condition or temperament of a patient of which he had no knowledge or which he could not have ascertained. If the practitioner engages a substitute, and the substitute is negligent, the substitute and not the practitioner is liable for negligence and malpractice to the patient.

Turning to the question of compensation for his services and his remedies therefor, and the defenses which may be shown to defeat his claim, mention should be made of the astonishing fact that in England, under the common law, a medical practitioner had no remedy to recover remuneration for his services. He was presumed to act with a view only to an honorary reward. It is not on record that lawyers were ever thus imposed upon, but it is recorded that the doctors did not tolerate such conditions long, and some people think they have made up for it since. Doctors should exercise great care in the commencement of their relations with a patient, so that the liability to the doctor for his services may be clearly established. Usually, the person requiring a doctor is not the one to summon him. It the patient is responsible, then of course there can be no question but that the practitioner may recover against the patient for services rendered, regardless of who it was who called him. If, however, the patient cannot respond to the doctor's charges, the doctor should protect himself by the law, so as to fix

liability where there is also responsibility. A person calling a physician or dentist to perform service on another does not make himself liable to pay unless he stands in such a relation to the patient as to make him liable under the law—for instance, husband and wife, parent and minor child, guardian and ward, and sometimes master and servant. In Missouri, where they insist upon being shown, the court has decided, in a suit against a father who called a physician to attend a child of full age lying sick at his father's house, that no promise could be implied, and dismissed the suit. Here in Rhode Island, however, where a mother engaged a doctor for her son not a minor, the court held the mother liable—although there were certain facts about this case which seemed to indicate her liability. The doctor should fortify himself with proof as to liability, and thus avoid lawsuits for his fees, and if he must go to court such proof will win the day.

One particular section of our statute law which I think is uniform in this country is a part of the statute of frauds, which decrees that to be valid the promise to pay another's debt must be in writing and signed by the one sought to be held. A doctor should insist upon a writing signed by a responsible party before he gives too generously of his time and attention to a case. The unwise and I may say unscrupulous practitioner, who proclaims "No cure, no pay," must do as he agrees, and if a cure does not attend upon his services the law spurns him, as the public should. Another thing of which a doctor should be careful is the going from one state to another where he has no certificate to practice. He cannot, according to Massachusetts law, which stands second to none in the common law of this country, recover for services rendered under these circumstances.

A frequent defense offered, in suits by physicians or dentists to recover for services, to excuse the patient from liability is that the plaintiff has been guilty of negligence or malpractice in the services rendered. When the patient takes this position, he is bound to substantiate his claim of negligence or malpractice precisely as he would be in case he was suing the doctor for damage, and he must show all the essential elements necessary to constitute negligence or malpractice, and that the damage to him at least equals the doctor's bill. If his damage is less than the doctor's claim, then the doctor will get judgment for the difference. If the patient shows a greater money damage than the amount of the bill, all the court will grant him will be a release from liability to the doctor.

The foregoing is an extract of the laws which concern you gentlemen. It seems to include all that touches upon your profession as dentists. You could not hope, in the time allotted, to have had presented to you an exhaustive treatise of the subject, and such a treatment has not been attempted. The committing of this paper would not pass you through an examination to practice law. The object has been to point out to you particular principles which vitally affect you gentlemen in your life's work.

The law exacts a good deal from the practicing dentist; in return it conserves his interests. It protects his property from theft, damage, and interference. It guards his reputation, his business, his home, and his life. It assures to him security in life, limb, and the pursuit of happiness, and if it does protect the public from him, it protects him from the public.

TUMORS.

By MARSHALL CLINTON, M.D., Buffalo, N. Y.

(Read at the union meeting of the Seventh and Eighth District (N. Y.) Dental Societies, Buffalo, October 29, 1909.)

"A TUMOR is a new formation characterized by more or less histological conformity to the tissues in which it has originated, and having no physiological function." (Park.) This concise definition of tumors as given by Dr. Park serves as a model in many text-books, and adequately describes the results of the complex conditions that result in tumor formation. From earliest times the etiology of tumors has been a frequent theme for academic discussion; today we know a few predisposing factors in tumor generation, but have not as yet found and isolated the initial stimulus or germ. For the past twenty-five years cancer, that most dreaded of all malignant growths, has been carefully studied in the laboratories of the world without it being possible to isolate the cause or find the cure. So many of the most brilliant investigators are devoting all their energies to this subject that it seems possible that the desired discovery will be granted us. The present-day opinion of some of the leading cancer investigators is that there is no one cause for cancer, but that many complex cell stimulants are capable of producing it.

Tumors incident to oral surgery have an appearance the discussion of which may be of interest. One can read in any text-book a classical description of any of the common tumors of the mouth or jaws, but one finds when attempting to differentiate them from each other that the descriptions are not always clear enough in their differentiation. The appearance of many of the tumors stands in direct relation to their rate of growth and their location, as well as the nature of the cells of which they may be composed; a small malignant growth in the early stages may be as harmless-looking and as devoid of subjective symptoms as a harmless or benign tumor. Many sarcomata and cancers requires weeks and even months to develop from the size of a split pea to that of a hazel-nut, and during that time cause no pain or discomfort by reason of their presence. This fact has been the reason why so many people have sacrificed their lives or have had advice that has resulted in such sacrifice. If only a beginning malignant growth would pain and hurt, how much better our records would be. The ordinary course of a malignant tumor varies from its beginning until it kills its victim in from one to three years, at the end of which time the patient dies one of the most dreadful deaths imaginable. The symptoms of tumors are in direct relation to their size, rate of growth, and location. A slowly growing malignant tumor may not produce as active symptoms of pain and pressure as a rapid enlargement of a harmless tumor, if it be placed where no marked pressure symptoms can develop. A sarcoma of the skin will show less symptoms than a fibroma crowding the teeth apart, but the former is extremely dangerous to the patient, while the latter is comparatively harmless except by position. The diagnosis of tumors of the face, mouth, and jaws presents many difficulties, but there are certain general symptoms and appearances that are of value in making an estimate of the nature of any growth. The location of a tumor and its relation to surrounding structures is important. Most benign tumors are covered with normal-appearing skin or mucous mem-

brane except when they are developing rapidly, when the overlying structures are filled with finely dilated bloodvessels. (This covering of congested bloodvessels is characteristic of all the malignant growths except when they are limited to bone.) A malignant tumor of the size of a hazel-nut that includes in its structure the skin or the subcutaneous structures generally exhibits dilated vessels on its surface. The most important tumor seen on the face is the epithelial tumor, which may be benign or malignant; when benign they assume the form of epithelial horns, generally found on the forehead, when malignant they take the form of carcinoma or epithelioma. These tumors are seen very frequently on the face after the fortieth year. They begin anywhere on the face, and a common point of origin is the edge of the skin of the lip and the mucous membrane. The least dangerous ones are found developing as a small dark raised flat spot similar in appearance to an ordinary mole on the cheek. After a few weeks these enlarge and assume a warty appearance. This type of skin cancer furnishes the quacks with their highest percentage of cures, for any type of caustic or cautery will destroy the growth and its base. Cancer developing more deeply in the tissues than the skin, or cases like the former, where the involvement reaches beyond the superficial tissues, are not safely treated with plasters and cautery. Some of our most doleful statistics come from malignant disease in the mouth and tongue. The average patient has an instinctive fear of the knife, and unless urged strongly will not consent to have anything done in a surgical way until most valuable time has been lost. The writer a year ago saw a man, forty years of age, with a small easily removable cancer of the lip; he decided not to have anything done, as he did not believe in operations. Recently the same patient called to see if something could not be done for him by operation. He presented a hopeless involvement of the face and neck that will terminate fatally in a few weeks.

Of all the symptoms that arise in the development of tumors none is so alarming as pain. It is frequently nature's last danger-signal that irreparable harm is being done by the growth. Occasionally, of course, a benign growth will cause a pressure neuritis, but it is wise always to regard pain as a distinct danger-signal. The consistence of a tumor is often helpful in determining the nature of the growth. A firm, hard, but not bony hardness, when occurring on the jaw, is characteristic of cancer. Hardness in the soft tissues of a tumorous mass, making the tissues feel leathery or gristly, is also characteristic of cancer. The soft elastic feel of angeiomata and cysts is characteristic, while the stony hardness of cartilaginous and bony tumors readily tells us of their nature. Cancer originates from the flat epithelium of the gums; when it has started, the first symptom that the patient notices is the loosening of one or two teeth. The gum in the immediate neighborhood is swollen and red, the tissues ulcerate early, and the area feels tender and sore. Putrefaction takes place in the broken-down tissues and a fetid breath occurs, with a disagreeable discharge. The ulcerative process extends despite all treatment, the teeth fall out, and papillary growths resembling a cock's-comb appear at the edge; the bone is invaded, with metastases to the glands of the neck. In regard to the diagnosis of malignant disease of the jaws, it may be said that sarcoma occurs mostly in young people or before the age of forty, while cancer is more commonly seen after this age. Chronic inflammation of the gums, injury and extensive caries of the teeth, are frequently associated with the development of sarcoma. Sarcomata of the alveolar process are commoner than sarcomata of the body of the jaw. Those of the process are fairly hard, while those of the medullary canal are very malignant and soft, ballooning out the bone to a shell-like thinness. When they attack the upper jaw, usually in the antrum, they are associated with constant pain even after the antrum is properly drained. The pain is constant, usually dull, and unrelieved

by drainage. The nasal passage is early encroached upon. As the tumor approaches the skin, it becomes hardened, red, and immovable; perforation of the skin is uncommon, although it perforates the bone in every direction, causing great deformity. The destructive process in the bone is so rapid that the condition may easily be mistaken for a pyogenic infection. One may find on probing a considerable mass of necrosed bone.

It may be noticed that very little has been said of the benign tumors. The reason for this is their relative infrequency. Unfortunately, the point of view generally taken is that any tumor is benign unless proved maligant, and the patient is advised to watch it and report if it becomes worse. This is the worse possible advice that can be given, as patients are too often sacrificed to the wish that their trouble may be of a harmless nature. It would be far better to regard every tumor of the face, mouth, and jaws as malignant, until it is proved to be benign. Treat every growth as the patient's enemy until it can prove its harmlessness. In the fourteen years that the writer has seen service in our hospitals, a large number of hopelessly involved patients with oral or facial malignant disease have come under his care all of whom told the old story of the doctor or dentist telling them not to bother with some small growth until it bothered them.

The treatment of all tumors, whether benign or malignant, is summed up in the simple admonition: Remove them. In the case of benign tumors this is a simple task, and may generally be undertaken by any dentist. In the case of the commonest tumor of all that we meet with, *i.e.* the cancers of the jaws and soft tissues, the proper removal is difficult, and in unskilled hands is dangerous. Epitheliomata or flat-celled cancers form the greatest number of the malignant cases in the mouth and jaws, and unfortunately they are the earliest ones to produce metastasis, with involvement of the glands of the neck. The use of the X ray in cancers of the face has proved of value in the type where the skin only is involved, the typical epithelioma, but in cancers of the lip and mouth has proved most unsatisfactory and discouraging. So far we have not found any drug that can qualify as a cure for cancer, despite the claims of the cancer quacks and of enthusiasts who are misguided but are not quacks. Every effort has been made to give the cure of any honest doctor who believes he has found a cure a fair trial in a goodly number of patients, but they have all proved failures. In sarcoma Dr. Cooley of New York seems to have found a toxin that has at times an inhibiting effect on sarcoma, and at times, though rarely, a curative effect. I believe it wise to use his remedy after a case of sarcoma has been thoroughly removed, or when removal is surgically impossible.

The writer will feel that his paper has not been presented in vain if everyone shall carry home the thought that every tumor must be regarded as menacing the life of his patient, no matter how small and insignificant a tumor may appear. Until you are definitely sure of their harmlessness, treat tumors as you would a stick of dynamite; they are more dangerous, in that the patients do not know the nature of their trouble, and cannot themselves take intelligent precautions.

THOUGHTS ON THE GOLD INLAY.

By ALFRED OWRE, D.M.D., M.D., C.M., Minneapolis, Minn.

WE progress rapidly in our technico-mechanical work, therefore it seems as if we had already reached a certain temporary halt in regard to the greatest discovery, the gold inlay.

Perhaps it is of great benefit to stop a little now and then. It gives us time for readjustment to environment and for taking an account of our failures and successes. One thing is certain, namely, that the enthusiasts have spent their surplus energy and are again to be found on earth among common ordinary mortals. Their pet theories are being tried out, and we are all testing the real truth in regard to the newcomer. We hoped that it would not take long to establish the status of this panacea—the cast gold inlay—when it was first introduced as a most practical venture.

The decided usefulness of some new discoveries is so apparent from the very first that no time is necessary to prove their *raison d'être*. In fact, their future status can be predicted almost to a certainty. We find, however, that time always works wonders, especially in establishing a certain fitness of things.

Of this we have a good illustration in the porcelain inlay. The enthusiastic outbursts of its advocates are still fresh in our memories. It could be used everywhere, and was so used by a few of the most reckless and yet honest admirers—honest because they certainly acted according to their conviction—but since time has determined the status of the porcelain inlay, we all feel a little easier about the situation. It is acknowledged now that it can be used almost everywhere where esthetic appearance is to be the only desideratum, otherwise it is safer to use it only when there is no stress, —when artistic results only are to be achieved.

Our adjustment, or conclusion, in regard to the gold inlay, is probably not so definite; yet we have, on the other hand, reached a certain stage in the journey that is well worth considering.

A little historic review will probably not be out of place in order to help us in obtaining a correct perspective. In the applied arts the inlay has been employed for many centuries; I think the first authentic specimens date back to 1500 B.C.

It is logical to conclude that the imitative bent in man's organization should manifest itself in dentistry as it does elsewhere. Although we have no actual historic data as to the application of the inlay for the cure or treatment of caries, several statements made in literature lead us to infer that it has a traditional origin. Strictly speaking, all fillings are inlays, but since dental terminology confines the term to that filling which is made practically entirely outside of the mouth and set as a whole, we had better adhere to such usage. Owing to this, our history may be called somewhat ambiguous, and perhaps not so realistically scientific as the present age demands. Still, the truth remains that the treatment of caries has in some way kept pace with all other development.

Perhaps we might even say without any special manifestation of selfishness that in this respect we show an adjustment to the age which is up to a reasonable public demand, but it is far from the ideal. Here we must acknowledge our decided shortcomings. The treatment of caries by filling is not our ultimate goal, and our preparation for the higher ideal, especially when we consider the rank and file, is not one that fosters the ideal.

But let us consider the gold inlay just

as it is, and as we are applying it today. We have a certain idealism in everything we do, nevertheless we must always remember that we are traveling toward the greater Utopia, and when we get there we shall again set sail. There is no such thing as a rest in the chase after perfection.

Taking this view of the situation, then, the gold inlay is to be considered in regard to the treatment of caries by filling operations, and in this sense only. How successfully can we combat caries by this *one* curative method? and, in general, what is the effect of its introduction upon dentistry? As stated, we can often foretell events or predict the usefulness of things. About six years ago, when confronting the question of the one ideal filling, *i.e.* before the casting process by Taggart was introduced, I said that if I should be limited to one kind of filling only, I should choose the cemented gold filling. I came to that conclusion after having made myself as familiar as possible with the achievements of the past, especially with pathology, general and local, and the relation of dentistry to the environment or the age in which we live.

Since the introduction of the Taggart system I am convinced that I cannot only make the same statement, but also make it decidedly more emphatically; yet at the same time we must not lose sight of the fact that this question should not be asked in the first place, or perhaps it would be better to say that questions are never indiscreet, but that the answers may be. The question, then, should not be answered as tradition has taught so many to do, namely, that gold is the best filling for all cases. We will have to undo this blunder for many years to come, and tell our patients that there are other materials which may be the ideal in certain cases.

When it comes, however, to a choice, this very material, gold, has the advantage in many ways, no matter how it is inserted. It has a powerful tradition behind it. Primitive man, as well as civilized moderns, are peculiarly attracted to it; primitive man by its decorative appearance, civilized man by its value and power. Thus far we have no great obstacles to overcome, except in a few well-balanced esthetic natures.

To be a little more definite, let us see how gold fulfils the requirements as a filling in every way and from every standpoint. To do this, we must reckon with our patients and the spirit of the age.

A concrete example will put us in sympathy with the situation very quickly. A few years ago a rather active and strenuous business man called at my office for dental service. Among other things, it was necessary to insert a mesio-occluso-distal filling, with two cusps to be restored in an upper first molar. He insisted on knowing how long it would take to fill it with gold; owing to his business activity he was keenly interested in this factor, time—more so than the average economist would be. He also was more or less used up as a result of overwork, overeating, and stimulating. Considering the ancient process of malleting such an extensive filling, I made the conservative statement that the insertion of this filling would require seven hours.

He replied in extreme disgust, psychologically analyzed, and in the plainest English, that it reminded him of the seven deadly sins. As a matter of fact I thought of the seven heavenly virtues as a healthier stimulus to success in that case; but not so the patient. It is evident to all that a compromise is necessary if anything is to be accomplished in such cases; it must be so in the vast majority. The malleted gold filling could not be used in this case because of two principal considerations, time and energy. The consumption of time and the consumption of energy, then, must be adjusted to suit the case.

The rapidity of modern living and the expenditure of energy must be met with by all, and we are not a class by ourselves; we must adjust ourselves in some measure to the environment. The malleted gold filling was the ideal filling at the time of the case mentioned above, but the spirit of the age and the patient could not and would not be blended into this unity. Necessity is the mother of

invention, no matter whether the end is the most correct in every sense or not. We are moving fast, almost too fast for a permanent adjustment it seems, but we were alert enough to begin just in the nick of time to do something in gold inlays. We were borrowing from the sciences and the arts, becoming more and more absorbed individually and as a body; the pressure for something more fitted to the age was tremendous. There was no use in trying to counteract this movement—the cast gold inlay, or something else equally serviceable and fitted to the environment, had to come. I do not believe any invention or discovery could have had a better reception than the cast gold inlay, because conditions were in such readiness for it. We were all ready for it, practitioners as well as patients; even without the press the news spread like wildfire, and those who tenaciously clung to the older method were quickly brought into line, especially in the cities, and at present there are very few dentists, even in the remotest districts, who are not aware of the epidemic.

We need not refer to the fact that the pendulum swung a little too far at first; a few failures and some keen observations will soon remedy the greatest drawbacks and give us the needed adjustment. It is interesting to note how really intense we can be when there is something at stake. One of my older colleagues told me in a confessional tone that he was forced to adopt the inlay because his patients began to leave him. There is nothing like a disaster to make us think and act. I wish we could apply some such stimulus in other lines that concern us as a profession in an equally vital sense, although not so immediately in significance. It seems as if we must be brought to the brink of the precipice before many of us come to a sense of self-realization.

The gold inlay, then, has a place, a very good place, but like all apparently easy things, it may work sore harm in the hands of the unscrupulous.

We have already heard the warning note. Our attention has been called to the fact that the technique of cavity preparation and the ultimate operation may suffer; even further, that our general skill may be reduced just as there was a drop in our mechanical cleverness when vulcanite took the place of metal in artificial dentures. Let us hope that this is not so significant in our general scheme as some seem to think. Some have also said that it requires greater skill, more attention to minutia and detail to get perfect results with the gold inlay than with the malleted filling, and I am strongly inclined to believe that there is more truth than fiction in this statement; but we have something else to consider here before we can reach any definite conclusion.

If it requires several years (seven to ten) to reach a certain stage of perfection—or should we say a certain balance? —in dentistry, and if certain branches require special attention in order to be practiced correctly, might it not be profitable to indulge in a little speculation as to the advisability of specialization in dentistry; periodically you have to emphasize this matter. We certainly cannot be experts in the whole field any more than can our medical friends, but just because our anatomical area seems limited is no reason for not specializing. A discussion on this point is not the object of my remarks, but the thought was one of those unconscious roamings which need expression. Let us return to some of the more definite considerations in regard to the operation itself.

First let us consider the application of the cast gold inlay. Without any doubt it can be used successfully in more cases than any other material; so far it is very near the ideal. It is, however, quite evident that malleted fillings, especially those of easy insertion, will be more economical in very small cavities. Perhaps we might say that in simple and ordinary approximal cavities in the anterior teeth the gold inlay is not indicated. On the other hand, we may say that in all extensive operations the gold inlay should be used, providing other conditions are favorable.

Next let us consider the cavity preparation, which we must admit is not so

thoroughly worked out yet as it ought to be for so extensive an application of the inlay as we are indulging in. Our hope is that some of our indefatigable workers will again come to the aid of the rank and file with some careful and conservative conclusions, perfecting the details for this operation as carefully as has been done in the preparation of cavities for malleted fillings. This is what we really need; there is too much hit-or-miss in the cavity preparation at present, but on the other hand we must not expect too much in so short a space of time.

The cardinal principles, however, are practically the same. The greatest difference is that now we depend partially upon the cementing medium for the retention of the filling as against formerly upon the retention form. Of course the resistance form aids largely in both cases.

Generally speaking, then, we may appropriately compare a cavity for an inlay with the simple carpenter's mortise. We must be able to remove the inlay in some direction, that is, in approximo-occlusal cavities in molars and bicuspids toward the occlusal surface; in the six anterior teeth incisally in approximo-incisal cavities and lingually in approximal cavities; in all simple cavities at right angles to the surface. Keeping this in mind fully, we get the various forms as established before. In obtaining outline form, we remember as before also the convenience form, and it is needless to say at this late day that the extension for prevention maxim is always to be borne in mind. The form of the cavity is modified in order to allow us to withdraw the inlay, otherwise the cavity preparation is not very different from usual practice. In regard to the resistance form, we shall probably soon conclude that this must be more pronounced, and we shall then probably have to resort to some means which will lend itself to a more perfect or accurate placing of the inlay. Perhaps this can be accomplished by acute angles, by grooving, by pins properly placed, or by a combination of these in some cases.

We speak of a retention form in cavities for inlays, but by this we do not mean undercutting, according to the old understanding of the term. The cement is of course the real retentive medium, but the resistance form is most important, after all, for retention. The shaping of the enamel walls and margins is to receive fully as much attention as it did formerly, if not more.

We might well say that the status of the gold inlay is perhaps not quite established. It came at a most opportune time; it had to come, and we shall save many teeth with it. With some adjustments, as outlined, it will probably hold its own for a very long time. The future, however, does not wholly belong to us, but we can indulge in imagination and speculative science to our hearts' content.

As a simple treatment for caries, the gold inlay will probably be declared the best we have at our command in what we might call a practical working sense. It is not a cure any more than the other fillings, because none of these cure farther than their own area, and so far they are all far from the ideal.

Nevertheless, there is one feature about the gold inlay operation which is of immense therapeutic value, that is, the sealing of the cavity with cement and the protecting of the cement from the wear and tear by the gold. Years ago we heard the leaders talk of that utopian dream, a cement which would withstand the wear and all other disintegration in the mouth. We have practically reached this ideal in the gold inlay, but it will not do to rest here; we must keep on struggling for something better. It is in this that the greatest virtue of this innovation lies!

In conclusion, let me emphasize the fact that all fillings are temporary expedients (using the word in the broader sense) in the treatment of caries. Of all these, the gold inlay, or let us say the cemented inlay, since other metals may be used, comes nearer to the ideal than anything we have yet discovered in the way of fillings. We have, however, a better treatment even now known—preventive medicine, or prophylaxis, which however cannot be economically or prac-

tically administered in all cases. Therefore, until in time to come some method of carrying out this most ideal treatment of absolute prevention shall be discovered, we shall probably have to be satisfied with the highest at present obtainable ideal, that of treating caries by filling.

THE NEED OF A CODE OF DENTAL ETHICS.

By GEORGE C. NICHOLSON, M.A.C.D., Melbourne, Australia.

(Read before the Second Australian Dental Congress at Melbourne, October 28, 1909.)

NOW that the dental profession in Australia has arrived at the stage of congress-ship, the time seems ripe for us to formulate certain rules and regulations for the general guidance of its practitioners.

I had hoped to present the British and American codes of dental ethics, but though I communicated with both countries, I regret to say the required information has not come to hand.

I am indebted to Dr. G. Cuscaden, president of the British Medical Association in Victoria, for his assistance in lending me an authoritative work entitled "Medical Ethics," a guide to professional conduct by Dr. Robert Saundby, from which I will quote conditions to an extent analogous to our own.

Lexicographers define ethics as "a system of moral principles," "a system of rules for regulating the actions of men." We, as a body of dentists, should see that our ethical system is duly formulated for the guidance of our members.

Each profession has its code of rules; the church, the navy, the army, medicine, and the law, etc., all have their courts where they deal with offenders against those rules. Therefore if we have rules it is necessary to render them effective, and we must have power to enforce them. In Germany there are medical courts of honor for such purposes.

Though individual dentists in Australia, for the last thirty years or longer, have conducted their practices as professional gentlemen should, the first occasion on which coercive action was taken in this respect was in the year 1897. The First Council of the Australian College of Dentistry then made it conditional for the admission of a student that he be obliged to give an undertaking, in writing, that he would conduct himself as a gentleman, and that when he graduated he would conduct his practice in a professional manner. I am glad to be able to say that I am unaware of a case being cited against any one of its graduates so far.

The Odontological Society of Victoria and kindred societies in the sister states have done splendid work in this respect, but there has been no attempt, to my knowledge, to band the ethical dentists of Australia together by a system of rules to which they could subscribe; and to you, as members of these societies, I appeal for assistance to crystallize, in words, the unwritten laws by which our better instincts have guided us in our professional work hitherto.

CORNER-STONES OF MEDICAL ETHICS.

The three principles which are regarded as corner-stones in medical ethics, according to Saundby, are: *First,* the relation of a medical practitioner toward his colleagues should be guided by the golden rule—which you all know;

second, in his relations to his patients, their interests should be his highest consideration; and *third,* his relation to the state, to the laws of his country, and to his civic duties—in other words, all lawful authority he should obey. These, I think, we should accept *in toto.*

Advertising. With regard to advertising, no dental practitioner should seek publicity by advertising, except in certain recognized ways suggested by good taste, such as a door-plate, not too large, with the practitioner's name and "Dentist," or "Dental Surgeon," thereon.

Medical practitioners are permitted, without losing caste, to give to the world the result of their study and experience by publishing books and papers; but these should not be advertised in the lay press, or sent widely for review to newspapers.

Another extract says: "The publication of biographical sketches, portraits, and other laudatory notices is to be deprecated."

Why is advertising objectionable?

The advertiser is obtaining an undue advantage over his fellows. He is often betrayed into making exaggerated and untruthful statements as to his abilities, thereby misleading inexperienced and credulous patients.

By a resolution passed December 1, 1905, the General Medical Council of Great Britain issued a warning that advertising may render a practitioner liable to be charged with infamous conduct in a professional respect, and, if found guilty, to have his name removed from the Medical Register. We would do well to follow on these lines.

Indirect advertising. Apart from direct advertising, I mention with hesitation the fact that some dentists, who should know better, have so forgotten what is due to the dignity of their profession as to deliberately deposit their professional cards in public places, notably in railway cars, where I have seen them myself.

When recently rusticating at the seaside, 140 miles from Melbourne, I again met my old friend, the ubiquitous card, bearing the well-known Collins st. address of its owner. This and other questionable practices, such as posting self-laudatory pamphlets, are quite unworthy of a professional man.

Consultations. It is pretty certain that in the near future there will be more consultations between dentists. There are many cases in which a young practitioner would do well to consult a man of more experience; and I have found, when I adopted this course, that the patients willingly paid the extra fee asked. This is a subject that will involve much consideration.

Commissions. Saundby says: "It is wrong for a medical practitioner to accept a commission or consideration for the introduction of patients to him." I am credibly informed that the amount of commission given by dentists, some of whom are of reputable standing is amazing. This is a blot on our professional honor which you will agree with me we should take measures to stamp out. I am not sure whether it is not also a breach of the Secret Commissions Act and therefore punishable by law.

Visiting courtesy call. Quite recently a young practitioner met me in Collins st., and said, "You have not been over to see me yet; I have had my rooms fitted up in the latest style," etc. Perhaps this was a pardonable mistake on the part of my young friend, but in the medical profession it is an old and established custom that a newly arrived practitioner should call upon his professional neighbors. It is an act of courtesy which establishes his right to social recognition, and should not be omitted. Those called upon should return the call, of course. The medical profession in large cities limit the area for visiting to neighbors within the radius of half a mile.

Etiquette. When I commenced practice in Melbourne I found, on calling on some of the older practitioners, that they were evidently quite unaware of this rule. On more than one occasion I was not asked to take a seat, and the interview was conducted in the hall! For the sake of the strangers who may settle among us, as well as the rising genera-

tion, this point of etiquette should be distinctly understood.

It is laid down in medical ethics (Saundby on "Dentists") that a medical practitioner has no right to expect to be treated gratis by a dentist, nor has a dentist any claim to services gratis from the medical profession, but it is very common, where a dentist and medical practitioner happen to be professional neighbors, to reciprocate in this way, neither is it in any way objectionable.

It would be objectionable for a dentist to attend the family of a medical practitioner on the understanding that the medical practitioner would, in consequence, send his patients to him, just as it would be objectionable for the medical practitioner to attend the dentist gratuitously on similar grounds.

Medical men co-operating with unregistered dentists. The warning of the British General Medical Council against co-operation by registered medical practitioners with unregistered dentists is quite plain: "Any registered medical practitioner who knowingly and wilfully assists a person who is not registered as a dentist in performing any operation in dental surgery, either by administering an anesthetic or otherwise, will be liable, on proof of the facts, to be dealt with by the General Medical Council as having been guilty of infamous conduct in a professional respect. Yet more than one medical practitioner has asked if he could not give an anesthetic for an unregistered dentist who comes into his neighborhood. This difficulty affords no excuse; but shows there are still openings for qualified dentists."

The members of the medical profession are cautioned not to become rivals of pharmacists, and support a particular man. I consider that a dentist should write his prescriptions, and give them to the patients to obtain the requisites where they please.

CONCLUSION.

If the subject of this paper appeals to you as it does to me, it would be necessary for committees to be formed in the various states to deal exhaustively with the foregoing items, and also with the following subjects: Etiquette, dental shops, exhibitions and shows, fees, appointments to clubs, benefit societies, and schools, patenting dental instruments and appliances, purchase and sale of dental practices, gratis patients, quacks, etc.

These subjects should engage the earnest consideration of the committees in the several states; and I would suggest that after due consideration and interchange of ideas thereon, delegates from the societies attending the Third Dental Congress be empowered to ratify what has been agreed upon, and create an "Australian Code of Dental Ethics."

SURGICAL DRESSING IN ORAL OPERATIONS.

By ISIDORE LETT, D.D.S., Boston, Mass.

THE establishment of proper drainage in oral cases involving a discharge of pus constitutes the most essential feature of surgical dressing. An accurate knowledge of the correct method is an important requisite for the attainment of the best results and the prevention of reinfection.

Operations have been performed where the general surgeon in attendance, being unfamiliar with the reasons for certain modes of dressing employed by the operator, has rendered unfavorable criticism on the method of procedure.

In one particular instance, that of a carious palatal process of the maxillary

bone, after the cavity had been opened up and curetted, a gauze dressing was introduced and adjusted so as to remain practically an eighth of an inch from the lips of the wound. The surgeon witnessing the operation argued in protestation of the fact that the maintenance of free drainage would be impossible without extending the dressing beyond the surface of the affected part. Here the general surgeon, as is also not infrequently the case with dental operators, was laboring under the false impression that it is necessary for the gauze to dangle from the wound.

Two excellent reasons exist for not permitting such extension of the dressing: First, skilful manipulation in inserting the dressing will allow drainage by permitting the lips of the wound to remain open; and second, absorption of microorganisms may ensue, if the dressing should advance into the mouth.

A case of considerable interest, illustrating clever surgery but improper dressing, recently came before my attention for treatment. The patient had undergone several operations for osteomyelitis of the inferior maxillary bone, the primary cause being a deciduous molar in which the abscess drained through a cervical sinus. As a safeguard against external infection cocoons had been placed over the wound, resulting in continuous discharges of pus through the sinus for four or five months. Upon removal of the cocoon, as was immediately advised, a thin scab was discovered beneath it. The latter was likewise removed, and the patient was dismissed with instructions not to bind up the wound. The serum at once coagulated, forming an antiseptic plug. A small draining-point still existed, but closed up within a week. Without further interference the patient recovered, good healthy tissue replacing the old sinus.

The method of drainage by inserting in the neck of the fistula a piece of sterile rubber dam about an inch square rolled between the forefinger and thumb is practically the best. This piece of rubber is placed in the fistula, and as soon as the digital pressure is removed, the rubber springs open, forming a tube. A wad of antiseptic cotton or gauze will insure the absorption of all matter under drainage, whether it be pus or serum. The rubber dam should be changed daily, diminishing it in size for probably a period of two or three weeks; the patient may be instructed to change the dressing several times a day, being careful not to exert pressure on the sinus. If, however, within a reasonable length of time the discharge has not entirely ceased, it would be advisable to remove the rubber dam, allowing the wound to granulate, provided that the microscope does not reveal any bacteria.

It is a recognized fact that, even in the presence of such bacteria as streptococci and staphylococci, many ugly wounds in the oral cavity and associate parts will heal, whereas in any other part of the body such conditions might result fatally.

CORRESPONDENCE.

"THE BARRING OF THE D.D.S. IN ITALY."

To the Editor of the Dental Cosmos:

Sir,—When I read Dr. Talbot's communication, "Progress of Stomatology in Europe" (Cosmos for March 1909, page 322), I confess that I hardly thought that he had really taken at their face value the two articles from which his information was derived, but I felt convinced, on the contrary, that he had but seized upon that occasion in order to reinforce his own idea and spur the Americans to continue to improve their dental schools. It is true, at the same time, that I felt ashamed to think that many members of the world of dentistry might take seriously such information—only to find out, in the near future, that it was simply a bluff.

To have rectified the matter at the time might perhaps have been judged to be an unpatriotic course on my part, but afterward when Rovida's unnecessary answer (Cosmos for October 1909, page 1184) to the useless DeVecchis' letter (Cosmos for June 1909, page 712) came, I felt it my duty, both as an Italian and as a true American graduate, to step in and expose the true inwardness of the status of stomatology in Italy.

We have here, first, a host of old-system dentists—from whose ranks some have stood out, because being able business men, they have managed matters well enough to take a standing that can be kept until modern dentistry has enlightened this part of the earth.

We have another bunch—that of M.D. graduates who, having no patients in the medical line, have bought a dental engine and a dental chair, and, hiring a so-called mechanic, have entered the dental profession—with the results, for the patients, that might be expected. Among them are, it is but right to state, a few who deserve admiration and respect for their work; but these are not usually the ones that blow the trumpet and fail not to miss any of the dental congresses.

We have a few, very few, foreign graduates—the majority of them Italian M.D. and American D.D.S.; these are doing well both for themselves and for science and for the public—but they do wrong in making a kind of unworthy alliance with the other M.D. would-be dentists, instead of binding themselves together and stoutly advocating what is needed—*a government dental college.*

The opening of that parody of a private dental school in Milan is, we must recognize, a step—if not a strong-man step, at least a drunken-man step—but one which, in my idea, was intended principally by Rovida and his associates to improve their private business and to try to tower above the other dentists; but between the venturing of that move and the effrontery of pointing out to Dr. DeVecchis and to the dental world that that school is something serious and of high standing there lies a vast distance.

It has always been my idea that a modern dentist should have a solid medical education; but such medical education must not be acquired at the expense of the necessary *full, complete dental education and mechanical training*—while the candidate, above all, has to find out whether he possesses the required special aptitude for the profession of dentistry.

President Rovida, if he cares for the future of Italian dentistry, must not limit his action to the barring of the American dentists from Italy, promoting protective legislation, and denouncing them to the authorities for using the title "Doctor," claiming that they have no right to it, but he should emphatically advocate the idea of the institution of a government

dental college of a really high character, connected with the most frequented university and framed after the American model.

Now as to the validity of the "act" of April 24, 1890.

The "Federazione Stomatologica Italiana" knows my opinion about it, and should also know that the Court of Appeal of Venice has already given a strong blow to its validity. And I am inclined to the conviction that the opinion of President Rovida really does not differ from mine—because, when he informed the Procuratore del Re (district attorney) of Naples that there was a man who designated himself a "Doctor" without being an M.D., and a "Surgeon-dentist" without having received that title by pulling a tooth from a corpse!* he knew very well that that man was a graduate of the Philadelphia College of Dental Surgery, one which stands high among the best, but he was afraid to state the truth, also to ask accordingly for the due punishment of the offense; but, instead, is invoking the enforcement by legislation of the famous "act" that now he says has *always stood as a law!*

It would therefore seem evident that Rovida's aim in sending that answer to DeVecchis' letter was to scare the possessors of the D.D.S. and prevent their coming to settle here.

Respectfully yours,

A. Augusto, D.D.S.

Naples, January 10, 1910.

PULP DIAGNOSIS BY THE INDUCED CURRENT EMPLOYED BY DR. MARSHALL NEARLY TWENTY YEARS AGO.

To the Editor of the Dental Cosmos:

Sir,—I have the honor to call your attention to a statement of Dr. Fuyt appearing on page 964 of the August 1909 issue of the Cosmos in speaking of the use of the faradic current in dental diagnosis and in which he quotes Dr. Tousey ("The Faradic Current in Dental Diagnosis," Cosmos, 1909, page 515) as follows:

> There is little literature and less history regarding its use. In June 1902 I demonstrated the method before the Harvard Dental Alumni. In January of the following year Dr. W. J. C. Fuyt of Amsterdam published independently in the *Nederlandsch Tijdschrift voor Geneeskunde* an article concerning the same matter.

Dr. Fuyt then states that he published this, not in January 1903, but January 1902, and that he had demonstrated it in September 1901.

For the benefit of these gentlemen and those of the profession interested in the matter I would like to call attention to an article by Dr. John S. Marshall, entitled "Electricity as a Therapeutic Agent in the Treatment of Hyperemia and Congestion of the Pulp and Peridental Membrane," found at page 251, *Trans. American Dental Association* for 1891, it having first been published, however, in the Dental Cosmos (vol. xxxiii, 1891, page 973), in which he states that—

> As a means of diagnosis in obscure cases of the vitality or non-vitality of the dental pulp, I know of nothing so sure to demonstrate to a positive certainty these conditions as the electrical currents, both the galvanic and the faradic. In the more obscure cases, however, the faradic is superior to the galvanic, for if there is the slightest vitality remaining in the pulp it will demonstrate it instantly by causing a response in the tooth. It is superior in this respect to the transmission of light by the electric mouth-lamp, for many times when the condition is on the border-line between the life and death of the pulp, the electric light fails to satisfactorily demonstrate the condition.

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* The proof of ability usually given by the majority of Italian dentists who now dub themselves *Professors!*

It will readily be seen that the above, written by Dr. Marshall in 1891, and the following, appearing in 1909, are on the same lines. In speaking of the diagnosis of the vitality or non-vitality of a tooth, Dr. Tousey says:

> In these cases the use of the faradic current in the manner to be explained is suggested. . . . It is adaptable in most every case, nor is its use confined to those more insistent troubles. The lesser and more numerous problems of everyday practice, the varying methods of procedure that hinge upon the vitality or non-vitality of the teeth are solved with the greatest readiness and dispatch.

Dr. Tousey states that there is little literature and less history regarding its use; that Dr. Fuyt and Dr. Grevers made reports upon its use in 1902 and 1903; but it is clear, as I have shown, that Dr. Marshall had used the method and reported upon its use nearly twenty years before.

Very sincerely,

JOHN D. MILLIKIN, D.D.S.

MANILA, P. I., December 10, 1909.

PROCEEDINGS OF SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, October 1909.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, October 19, 1909, at the Academy of Medicine, No. 17 West 43d street, New York city.

The president, Dr. W. D. Tracy, occupied the chair, and called the meeting to order.

In the absence of Dr. Dunning, Dr. B. C. Nash acted as secretary, and read the minutes of the annual meeting, which were approved.

The paper of the evening, by Dr. GEORGE T. GREGG of Pittsburg, Pa., entitled "The Relief of Pain During Dental Operations," was then read.

[This paper is printed in full at page 293 of the present issue of the COSMOS.]

Discussion.

Dr. W. A. HECKARD. After reading Dr. Gregg's paper I prepared a few notes, but the doctor has mentioned some additional points not contained in his paper. I allude to these only in order to say that I believe them to be true in every respect, except that some of the things he mentioned date back farther than three years, as I believe he stated.

I admire Dr. Gregg's paper, for what he has said is true, though everybody may not believe it. The essayist might have gone farther, perhaps, and said, To cause pain deliberately is malpractice, or, Some of the pain that is being daily inflicted is, to say the very least, unethical. I refer to the dentist who says, "Now hold still just a moment; I shall have to hurt you somewhat," and then presses a bur or drill against the dentin until the friction generates heat and pain, and he calls the dentin "sensitive."

In many cases, to be sure, we must press very hard to do the burring properly, but then nitrous oxid and oxygen should be used. This is the safest anesthetic, since the tooth does not have to be saturated with drugs, as in pressure

anesthesia by syringe or cataphoresis, when it is beyond the power of man to guess or control the extent of the penetration of the drugs.

Nitrous oxid is my oldest dental friend. I saw it being administered the first day I entered a dental office, and it impressed me at once. I have studied it and used it from that day on, and would administer it to every patient who needs it if he would let me. I indorse in principle all that Dr. Gregg has said, yet, at the risk of seeming inconsistent, I intend some day to tell of my experience with chloroform, which I use sometimes for partial anesthesia. I buy it in 5-gram bottles, keep it in a cool dark place, and never use a bottle the second time. I consider it perfectly harmless when used after the method of Dr. Hewett of Chicago. But no one can disprove the essayist in respect to the safety and certainty of nitrous oxid and oxygen for the relief of pain in dental operations. If dentists would examine this anesthetic as carefully and as persistently as they do other branches of dentistry, they would all be using nitrous oxid and oxygen just as they use the dental engine or filling materials. Some dentists may be too cowardly to use this anesthetic, as some are too bold, but the majority could and should administer nitrous oxid and oxygen to their patients. The general surgeons have a license to look down upon us in this respect, for they are using the anesthetic which Horace Wells discovered for relieving pain in operations of much less magnitude than those for which we refuse to use it. Is there any pain worse than "tooth-pain?" One of the best papers to which I have ever listened was read by Dr. S. G. Perry the other evening on "Ethics," a plea for the practice of the golden rule. Here is where we may practice it, and I assure you, as does the essayist, that the results will be most gratifying. We should study the subject well, select the anesthetic which we can handle with the greatest safety and over which we have most perfect control. Anyone not at death's door may take nitrous oxid and oxygen with perfect safety. For the purpose of illustration I will briefly cite three cases:

Case I. A man about forty-eight years of age, weak and anemic, had had an abscess of the lungs with an external opening discharging pus for years. Nitrous oxid alone was administered (this was before the days of nitrous oxid and oxygen), for a small operation of a few minutes' duration.

Case II. On a man about sixty-five years old, with weak heart, an operation for a very large carbuncle on the back of the neck was performed. The patient had to recline forward with his face on a pillow—could that be done with other anesthetics? I sprayed the nitrous oxid and oxygen under pressure against the pillow, and he inhaled it with no difficulty. The duration of the anesthesia was not recorded, but I used 100 gallons of nitrous oxid.

Case III. The patient, a woman about forty-five years of age, had such weak lungs that I could not see or hear her respiration. The operation was not of a dental nature. I had to use a chilled mirror to determine whether she was breathing or not. The room temperature was lowered, and the nitrous oxid warmed. I used 300 gallons of nitrous oxid, and while the time was not recorded, it was said to have been over an hour. Toward the end of the operation the patient was only partially anesthetized, and I was conversing with her most of the time, keeping her just on the border line between partial and complete anesthesia.

These cases and a number of others of equally serious nature were operated upon with the very best results, for if they had not been very serious, nitrous oxid would not have been used. I warmed the nitrous oxid by placing a small gas stove under the steel tank (receiver). Heat accelerates chemical action, therefore it takes much less warm nitrous oxid to produce the same stage of anesthesia for a given time than it does cold nitrous oxid, and the chilling of the respiratory tract is obviated.

In most dental operations it is not necessary to render the patient com-

pletely unconscious. When Dr. Hewett of Chicago had mashed one of his fingers, and it had to be amputated, he held the anesthetic in his other hand and anesthetized himself partially, directing the surgeon at times by the slight sensation which he felt, but experiencing no pain.

No one has yet operated or ever will operate on my teeth without an anesthetic, not because I cannot tolerate pain, but because it is unnecessary.

I seldom resort to inhalers of any sort since I invented the apparatus which is before you, and which I described in a paper that was published in the Cosmos* under the heading of "Continued Anesthesia with Nitrous Oxid Under Definite Pressure." I keep a cylinder of compressed free oxygen at hand, but rarely ever use it with nitrous oxid. I cannot remember having ever had to use it on account of cyanotic or other reasons, but I administer oxygen in combination with nitrous oxid by using the atmosphere. The air we breathe contains about 20 per cent. oxygen, the other 80 per cent. being mostly nitrogen, and I find that I am obtaining better results with air than I did with oxygen in the free state mixed with nitrous oxid. I proceed in this manner: Starting the nitrous oxid slowly, I gradually increase it under definite pressure. In the early days I used gages, but now I have no more use for a gage than I have need of one to tell me when my blowpipe flame is too hot for a case which I may be soldering. I continue turning on the nitrous oxid, thereby lessening the intake of normal air, until partial or complete anesthesia is established, depending on the amount of air that has been excluded, and not on how much free oxygen is mixed with nitrous oxid when all normal air is excluded.

This method has given better results in my hands than any other. The rubber dam is a convenience instead of a hindrance, as one might suppose, because the nitrous oxid is gently sprayed into the nose or mouth, or both, and as the patient does not have to draw it from a bag he gets only the amount desired by the operator. If the patient breathes regularly through the nose, I hold the rubber dam closely around the mouth; if the patient has a bad cold or if the nasal passages are obstructed from any cause, I use the mouth, turning the dam up over the nose and advising the patient which way to breathe.

I have used pressure anesthesia for years, but only for devitalizing, never for obtunding. I like the method of a tapered hole mentioned by the essayist, and shall try it. This model [exhibiting] represents a case in which pressure anesthesia could not be used, for a shred of cotton drawn across the worn-down teeth caused pain. I administered nitrous oxid and removed the pulps from the six lower front teeth in two minutes, dressing the canals after the patient had awakened, afterward crowning them and bridging and crowning the rest of the teeth in order to lengthen the bite.

If really serious cases can bear nitrous oxid with ease and safety, why should dentists fear to use it in dental operations?

Instead of bags I have a seamless steel tank [demonstrating], tested at 300 pounds per square inch. The gas is passed from the cylinders as we buy them, into the tank, and I employ compressed gas instead of liquid gas. The gas goes into the steel tank at the left and is drawn out on the right, the flow being regulated with a pressure regulator. When a 100-gallon cylinder of liquid nitrous oxid is allowed to escape into the tank, the pressure in the steel tank runs up to about 150 pounds. It had been about 1000 pounds in the small iron cylinder. Only about one gallon of gas is lost by being left in the iron cylinder.

The assistant can hold the nozzle and manipulate the pressure regulator, or shut off and turn on the gas as instructed, and likewise while the operation goes right on can replace the empty cylinders by full ones, if the operation should be a lengthy one.

My assistant handles the nitrous oxid

* See Cosmos for January 1902, vol. xliv, page 16.

at the chair in much the same way as we use the compressed air; she sprays it via the mouth or nose, as I tell her. I usually motion, and she understands "nose or mouth," "more or less gas." I soon find about how much the patient will consume in maintaining the desired stage of anesthesia; I then let the pressure regulator stand at that amount.

A patient can be anesthetized by means of a washbowl or a hat by placing his head over the bowl and well into it, and no matter whether you turn the gas into the receptacle in front or back of his head, he will be anesthetized. It is advantageous to know the principle of what I have stated, because in some operations, such as adenoid and bloody operations, the patient's head can be placed in such a position that the blood does not flow into the stomach and lungs. With gas under pressure, such as I have been advocating, one may place the patient in any position and spray the gas to him under pressure.

Dr. M. I. Schamberg. I am more than interested in Dr. Gregg's paper, and in Dr. Heckard's discussion. Personally I am much annoyed by partial anesthesia, and my patients are equally so, but I do not wish to influence or bias you against a trial of this method. In surgery we find it absolutely essential that the patient be completely anesthetized if the work is to be conducted satisfactorily; that is, if we promise anesthesia at all, it should be complete.

I recall Dr. Heckard using this apparatus before it was modified, at Niagara Falls about eight years ago, in a case in which I was amputating a root. Unfortunately, in that case—it may have been due to the fact that we were working at a clinic, and the surrounding conditions were not of the best—the anesthesia was not as satisfactory as it should have been, and I had to resort to cocain. I speak of this because I feel somewhat guilty that while I have experimented with nitrous oxid to some extent, I have not, like the other members of the profession who are working along this line, contributed something for use in excavating sensitive cavities. While I speak disparagingly of partial anesthesia in my own work, I would not for one moment have you cast aside the benefits that might accrue from experimenting with it. I fully realize that in order to get the best results from any method, a practitioner must perfect himself by long experience, and maybe, if I were to experiment with nitrous oxid without producing deep narcosis, I might be able to perform operations in that way.

Candidly, however, in surgery the patient should be completely anesthetized. I recall Dr. Cryer bringing a Hewitt apparatus to the United States some fifteen years ago, for the use of nitrous oxid and oxygen. I believe I was the first subject in the United States to be given this combination experimentally at that time, and from then on I experimented with nitrous oxid and oxygen, administering it at several of the hospitals in Philadelphia. But I was not so enthusiastic after observing untoward effects in one or two cases, such as extreme exhilaration of the patient, due perhaps to my faulty technique. In one case, where I kept the patient under the influence of that combination for three-quarters of an hour for the removal of some inguinal glands, the patient seemed to have twitching or convulsive symptoms. We treated the case as one of shock, and the patient rallied satisfactorily.

I would not discourage the practice of these methods. I believe that other operators have gone farther than I, and have perfected the technique. In doing surgical work, however, complete anesthesia must be obtained to satisfy the patients, and that is one reason why I have discarded this method.

The combination of nitrous oxid and oxygen is not as favorably indicated in oral surgery as it is in operations on other parts of the body, and only permits of brief work. I prefer other anesthetics, nitrous oxid, for instance. Satisfactory anesthesia is obtained very quickly, and no nausea is experienced as it generally is with ether. The combination with oxygen enhances the value of nitrous oxid—if anything, rendering it even less

dangerous than nitrous oxid alone. It rests with the operators who have been experimenting with this mixture, and those of you who will take it up, to determine whether or not it will be as helpful as Dr. Gregg states.

Dr. Heckard. I would like to tell Dr. Schamberg, in reference to that case at Niagara Falls, that I learned afterward that the new apparatus had not been charged; the air had not been driven out of it, and consequently I was administering half gas and half air. Probably he has not heard of it, for I did not announce it publicly. No patient will go to sleep when that amount of oxygen is administered. Moreover, it seemed to me that all the spectators that were crowded around that patient were handling and pinching him, which alone would have made it almost impossible to get a good result.

The President. What is Dr. Van Woert's opinion on cataphoresis and analgesia?

Dr. F. T. Van Woert. I have as much faith in the anesthetic properties of cataphoresis as I have ever had, and my reason for its practically complete abandonment is that in many cases the galvanic current passing through a tube devitalized a pulp. Very early in the use of this method, I found that teeth subjected to a few minutes' application of the current presented all the appearance of devitalized teeth, which condition I term an "electro-pathological" condition, and a great many of these pulps did not recover. For that reason I use the cataphoric apparatus only on rare occasions.

I have been extremely interested in the presentation of the subject of nitrous oxid as a means for the alleviation of pain in the treatment of teeth. It is somewhat of a question in my mind whether such extreme measures are necessary. I am led to believe by the gentleman who opened the discussion that much unnecessary pain is caused by the use of dull instruments and excessive pressure. He spoke of the pressure upon burs as causing pain from friction. Such excessive pressure I consider absolutely unnecessary, and a decided detriment to the tooth substance as well as to the life and usefulness of the instruments employed.

In the first place, burs or drills or any of the appliances which are placed in the dental engine should be run at a speed proportionate to their size and cutting surface. For instance, a No. $\frac{1}{2}$ round bur run at the lowest possible speed of the engine will drag, thereby producing friction and pain. On the other hand, a No. 12 round bur, because of its larger cutting surface, would prove much more efficient when run at a low speed. In either case, when pressure sufficient to cause the bur to sink into the dentin to the depth of its blades is employed, the bur ceases to be a cutting instrument and becomes a burnisher. If, on the other hand, a good sharp bur is used, run at a speed proportionate to its size, with only sufficient pressure to make it cut with perfect clearance, a minimum amount of pain results, and no injury is done to the tooth substance by the heat produced by friction. This, to my mind, comes nearer to the ideal method for alleviation of pain in dental operations.

Burs should never be used more than two or three times, and often should be cast aside after having been used once.

W. T. Brown, M.D., New Mexico. I wish to state that I have got into the wrong pew. I am a stranger in town, and I came here to the Academy of Medicine to attend a section on internal surgery. I could not for a long time understand what was going on here, but I have been extremely interested, and especially would I like to ask the gentlemen present what experience they have had with this anesthetic in the removal of tonsils and adenoids. I have been very strongly impressed, because I am much opposed to ether and chloroform, which are dangerous. Today, in one of the hospitals, I witnessed a very sad case. A little child of three years was operated on for enlarged tonsils and adenoids, and died shortly after.

Dr. Gregg. I shall be glad to answer the doctor's question. In Pittsburg I have been trying to interest the medical profession in this method. I am not in-

terested in any financial way in the Teter apparatus; I only know that it is a useful contrivance. I had Dr. Teter come from Cleveland on two different occasions to demonstrate this apparatus before the medical profession in Pittsburg. His first visit was paid to the Eye and Ear Hospital; Dr. Day and Dr. Jackson, whom some of you may know, were there. Dr. Jackson operated on several cases that day for the removal of tonsils and adenoids.

Dr. Brown. Did he do the tonsillotomy enucleating the tonsil?

Dr. Gregg. I cannot say.

I believe the conclusion they came to was that this mixture is not a good anesthetic for nose and throat operations. It has to be administered through the nose in order to keep the patient constantly under the influence, and thereby so much blood is blown out into the operator's face that he cannot see. They removed the tonsils in several poor children, who rallied immediately after, but it seems that there was so much blood that the operators could not see their field of operation clearly. Dr. Sandels was the only one of the three physicians present who liked the anesthetic. After that, a surgeon amputated a toe for a young girl, which took probably twenty minutes. He did not seem to hurry at all, and they all remarked that it was the most beautiful anesthesia they had ever seen. The patient was perfectly quiet, as though she were in a natural sleep. When Dr. Teter shut off the nitrous oxid and inflated the lungs with oxygen, she awakened with a smile on her face.

I know this anesthetic to be good, and I am sure that after some personal demonstration I could convince every one of you of its superior properties.

Dr. Brown. There is one thing, at any rate, that I have learned. The next dentist who tries to afflict me with a hot bur will be sorry! [Laughter.] I have enjoyed listening to you. I always thought dentists were absolutely heartless, and it is interesting to me to find that you are gathered here to discuss the means for the relief of pain!

Dr. Van Woert. I should like to add a word to my previous remarks, and suggest that a jet of cold air directed upon a revolving bur makes a most marked difference in the amount of pain produced.

This seems a good time to set right a mistake that I made two or three years ago, when I supposed that I was the discoverer of that fact. I should have known better; Dr. Kells of New Orleans introduced this method so long ago that it had slipped my mind entirely.

Dr. Watkins, Montclair, N. J. I did not reach the room in time to hear the reading of the paper, but I heard a part of the discussion, and was intensely interested. It strikes me that the method which has been shown to us is perfectly practicable; I wish we could all adopt it. I have at various times for twenty years at least used nitrous oxid in cases similar to the one which Dr. Heckard passed around, in which there is a great deal of abrasion of the teeth and the pulps are so nearly exposed that they have to be devitalized. I simply anesthetize the patient and drill into the tooth. I have done it many times with very happy results. I have also used a great deal of ethyl chlorid, which works beautifully in many of these cases.

A Member. By inhalation?

Dr. Watkins. No, just in the form of a spray. This is especially valuable in teeth with cervical cavities, which are exceedingly sensitive. I find that these much-dreaded cases are really my easiest ones. I use ethyl chlorid and can assure my patient, before I begin, that I shall not hurt him while drilling by simply spraying until an ice is formed. I use this method quite extensively. I have been greatly interested in this discussion tonight, and I hope that some of the other gentlemen will express their opinion on the method suggested, as I would like to hear more about it.

Dr. Chas. F. Ash. I have been intensely interested in this subject, and have tried to alleviate the sufferings of my patients by using various agents which were brought to my notice. This particular method appeals to me as being the most sane and rational that I have heard

of. I notice that Dr. Watkins said he assures his patients that they would not be hurt one particle with the bur. I have had that experience, too, but it is very much like what is said of some surgical operations—the operation was successful, but the patient died. I never yet have been able to successfully anesthetize a sensitive cavity with ethyl chlorid without causing a great deal of pain. Ethyl chlorid was put in my hands by the firm that had the agency for it in this country. One member of the firm was a patient of mine. They asked me to experiment with it, and I had to return a report to them that in my hands it was not successful. Its application caused usually as much pain as would be occasioned by a carefully handled bur.

In a number of cases I excavated two cavities in approximating teeth, one with ethyl chlorid and the other without, and each time the patients said that they would much prefer to have the operation performed without the ethyl chlorid.

When the ether spray was introduced to me, the agent assured me that I would be surprised at the results. I was enthusiastic to obtain some means of relieving pain for my patients. I was afraid to use it, and asked the agent to apply it for me, as I wished to learn the technique. The agent applied the ether spray as carefully as if he were to do the operation himself, but in the two cases tried we were not very successful. Moreover, the subsequent patients entered the office sniffing and asking whether I had started a hospital. One lady had to leave the room, because she was so easily affected by the memory of an experience which she had had that she could not tolerate any suggestion of ether.

It is not necessary to speak of the hypodermic, as many operators maintain that it is not safe to use it unless we want to remove the pulp. It seemed to me, while I was listening to the essayist, that I have been inflicting a good deal of unnecessary suffering on my patients while it was possible to use the mixture suggested. Some may say that it is not practicable to use it, or that people may not like the appearance of the apparatus; but if we have nervous patients and we can obtain relief for them and do not do so, we are to be held responsible.

Dr. Watkins. I can hardly understand Dr. Ash's experience with ethyl chlorid, because my own experience has been so totally different. I have hardly ever used ethyl chlorid on a patient who has not asked to have it used again in preparing a similar cavity. Patients generally lean back in the chair and say to me, "Now, doctor, promise me that you will freeze that before you touch the tooth." The ethyl chlorid does hurt when first applied, but the pain is tolerable.

Dr. Schamberg. I merely wish to add a few words, as I fear that my remarks may have been a little too discouraging. I want to state that I am quite convinced that Dr. Tracy is sufficiently interested to have an apparatus installed at our clinic, and I shall be very glad to experiment with him for the purpose of giving the profession in New York the benefit of our findings as to whether they ought to instal these apparatus in their offices. Dr. Rhein, some three or four months ago, asked me about it. I recall discouraging its use at that time. Fearing that my discussion might influence you against it, I wish to state that it must have value when a man of Dr. Gregg's stamp comes before us and tells us of his results, and I feel that we are in duty bound to try it. We have had contrivances in the past that aroused enthusiasm, and caused us to instal apparatus which we afterward abandoned, and for that reason I would rather have Dr. Tracy instal an outfit so that we can experiment for the benefit of the masses.

Very recently I saw Dr. Tracy excavate a cavity for a poor little girl, and he said, "Isn't it a shame that these people will let their teeth go in this way?" but unfortunately, the rich people do the same, and we need an anesthetic in general dentistry that will alleviate the pains of the dental chair, because we know how severely the profession is censured for the pain inflicted. This brings about the advertisement of some clever men who reach the public by means not adopted

in general practice. We have much to learn from these advertising men in that respect, and you will find that they use anesthetics much more freely than we do. The unfortunate part of it is that all of their work is not conscientiously conducted; but if we would take from them the good part of their practices, and exclude the bad, we might benefit by it.

I rose to say that I have perhaps discouraged the use of this anesthetic too much, but I will certainly take it up again, although I have no occasion to use it in my own practice.

Dr. Hedley Visick, London, Eng. I did not expect to be called upon; I am a stranger here. I have had a little experience with nitrous oxid in the extraction of teeth, and I certainly will vouch for the good results from the use of oxygen with nitrous oxid. Patients always seem to keep their color much better than with nitrous oxid alone, and the operation can be prolonged indefinitely. For very bad third molars I have used it with good results.

It seems that over here men have not used paraform at all. We had a paper read before our Odontological Society on the use of paraform in dentistry. Paraform is one of the formaldehyd group, which can be mixed with zinc oxid, and if made into a paste with eugenol or one of the essential oils, it will desensitize the dentin absolutely. It has only a local effect, and is invaluable in cases of cervical cavities. It must be left in the cavity for about three days at the outset. I use one part of paraform to twenty-five parts of zinc oxid, and mix it to a thin paste with eugenol. I have never known of a case in which the pulp was devitalized as a result of its application. It has not the same effect as arsenic, and does not penetrate so deeply. I think it would be worth while for your members, if they can, to get hold of the transactions of the Odontological Section of the Royal Society of Medicine (as it is now called) in which that paper was given, and read it. It is a very interesting paper, and advocates the doing away with this general anesthesia to a very great extent.

In London we should find the use of a general anesthetic rather prohibitive, because of the price. It would be different if the dentist could administer the anesthetic himself, or if a doctor who lived in his house could administer it for him; but as a rule we call in an anesthetist, and he usually charges a fee which the patients do not care to pay—they would rather stand a little more pain. [Laughter.]

Dr. W. E. Hoag. Has Dr. Visick ever taken out a pulp that has been treated with paraform, or with any drug of the formaldehyd group?

Dr. Visick. I have never known a pulp to be affected to such an extent that it had to be taken out, if the paraform was used in the correct proportions. If you have a very deep cavity it is unnecessary to use paraform, because you can get a retention there.

Dr. Hoag. About two years ago I tried formaldehyd in a 40 per cent. solution, mixing it with eucalyptol. In a large number of cases this dressing was attended with good results, desensitizing the dentin, especially in very shallow cavities, but in the deeper ones it affected the pulp. In one case, after leaving the dressing in for a week, I found that the pulp was practically dead, but without the bad results which follow the use of arsenous oxid. Closer examination showed that the pulp was of the exact size of the chamber, white and leathery. Upon its removal it gave every evidence of being thoroughly tanned.

Dr. M. L. Rhein. The subject is one that has always interested me extremely. I rather regret the trend of the discussion, because I believe the subject to be too large and comprehensive to be taken up as it has been this evening, the discussion having departed vitally from the subject of the essayist, who confined himself entirely to the possibility of our doing dental work without inflicting pain, and we should probably have been far more benefited if we had confined our remarks to this phase of anesthesia, rather than to have allowed the discussion to drift into oral surgical operations or other forms of the application of anesthesia.

A great deal of the discouragement of the dental profession in regard to painless dental operations is due entirely to their unwillingness to try out the technique necessary for any of the methods of local anesthesia suggested. I thoroughly indorse what Dr. Van Woert has said against the common slanderous remarks as to the impossibility of obtaining anesthetic effects from cataphoresis. The value of cataphoresis for the production of anesthesia of dentin is as potent today as it ever was, and its ability to produce the result was absolutely proved when it was brought out. It is used extensively in Germany at the present time, as Dr. Blum, Dr. Schamberg, and I have heard during our recent trip abroad. I do not agree with Dr. Van Woert's reason for discontinuing its use, although I admit that I use cataphoresis at the present time very rarely, because we have measures by which local anesthesia can be produced in a much shorter period—that being my only reason.

As to Dr. Van Woert's remarks that he found that pulps were destroyed by cataphoresis, I have been unable to observe a case of death of the pulp resulting from its use. I can, however, readily perceive that such a result would follow the use of formaldehyd in many cases such as illustrated a few minutes ago by one of the speakers. In all such cases the death of the pulp was only a question of time, as it was already so diseased that it would have been better to remove it. If proper means and usual precautions be employed, a healthy pulp is never in danger of death from any such measures; those reports are probably made of cases in which the pulp has been so badly diseased that death of that pulp would have inevitably ensued under any circumstances.

Furthermore, I use cataphoresis very little because I agree with Dr. Gregg's opinion as to the great value of the high-pressure syringe for producing local anesthesia of dentin. The value of this instrument does not seem to be properly appreciated by the average dentist at the present time.

Dr. Schamberg's remarks on the use of nitrous oxid and oxygen for our purposes do not apply to Dr. Gregg's method of employing them. We are aware that it is necessary to produce complete anesthesia in such operations as Dr. Schamberg referred to.

If nitrous oxid and oxygen can be used to a degree such as the essayist speaks of, the patient retaining full consciousness, and, as I understand it, being able to himself regulate the amount of nitrous oxid, and if the operator can work under the same advantage as he can without it, this anesthetic must be of inestimable value in a large number of cases.

I have been discouraged from introducing it in my practice, not by what Dr. Schamberg has told you, but the remarks made on this same subject by Dr. Ebersole, who has spoken very discouragingly of his experiences with its use in the city of Cleveland. Of course, different men have different ideas on the same subject, and like Dr. Schamberg, I feel that we ought to give it a careful trial in order to demonstrate its proper field.

In regard to the use of cold in producing anesthesia, I agree thoroughly with Dr. Ash's remarks on ethyl chlorid. Unless we can produce instantaneous anesthesia by cold, the use of any agent the effect of which is as slow and gradual as that of ethyl chlorid produces unnecessary pain.

About eighteen or nineteen years ago, I introduced to the profession the use of methyl chlorid for this purpose, and its value is just as potent today as it was at that time, the difference between methyl chlorid and ethyl chlorid being that the methyl chlorid produces instantaneous anesthesia in any tooth, so that the pulp can be immediately entered into and removed. Sensitive dentin can be removed without any sensation, while the amount of the drug to be used is minimal.

Unfortunately, until a few weeks ago, I was deprived of its use for some years, because McKesson & Robbins, who had imported it from Paris, declined to import it any longer. I felt its loss so much that I went out of my way while

I was abroad this summer to obtain a quantity of it, and I feel that I have added to my office apparatus an agent the usefulness of which I have established. If the value of this agent were properly appreciated, there should be no difficulty in having it imported into this country. Its manufacture in France is extremely cheap, but it is so expensive to import it as to render its use prohibitive. I have thoroughly demonstrated its value, but as is the case in many other things, the members of the profession seem either unwilling to obtain an apparatus by which it could be used or they lack the interest to take it up.

The physician who was with us this evening stated the true condition of affairs when he expressed his surprise at the fact that we are discussing a subject of this kind, because he did not think that it interested us sufficiently. The benefit that the public at large derives from meetings of this kind is very small, judging from past experience, because the average dentist is unwilling to go either to the expense or to the trouble of trying these suggestions, and that is one of the most detrimental criticisms that can be raised against the practitioners of this specialty of medicine.

I am pleased that the essayist quoted a statement of mine. The profession really ought to cogitate upon this subject, because we are held up today by medical men throughout the country as being brutal because we do not attribute sufficient importance to the necessity of doing our work under a condition of anesthesia, although so many methods are available.

It is important that we ascertain the relative value of the different anesthetic agents, and their proper field of application.

Dr. R. G. Hutchinson. The method suggested tonight will be of inestimable value in my work. As to the method of administering this anesthetic, I must plead ignorance. I would like to say a word on the relief of pain in corroboration of Dr. Van Woert's remarks in regard to burs. A great deal of entirely unnecessary pain is occasioned in our operations. I believe that more than 50 per cent. of pain in dentistry is due to rough handling.

Ten or twelve years ago, I treated an extremely nervous and sensitive patient who dreaded every dental operation. He had a cervical cavity in an upper canine, which is generally the most sensitive spot of the entire denture, and he did not want to have that cavity filled, but would rather let it go. I assured him that I could fill it without pain. The rubber dam was adjusted, the cavity was dried—not desiccated—and 95 per cent. carbolic acid was applied to the surface. The surface was then dried again, a new bur applied at the proper rate of speed, and the cavity excavated in a very short time. When the undercuts were all ready for the introduction of an old-fashioned gold filling, the patient was very much surprised at the absence of pain.

I must confess that I have perhaps not always been so careful, but it is possible by the proper use of sharp instruments delicately manipulated to perform our operations with a minimum of pain.

Dr. Heckard. This apparatus is the first one I had made. It is the one I use, and I have none on the market. I have had no time to modify its size and shape since its invention. While I can operate this apparatus with ease, its manipulation can be improved, and its size need not be much larger than a Taggart inlay casting machine. The only reason why I brought this old apparatus before you this evening is because I wish to show you that I anesthetize with nitrous oxid without the use of an inhaler, obtain better results, and do not frighten the patient.

Dr. Gregg. I wish I could make every one of you promise to look into this subject, because I believe it would prove one of the greatest godsends that you could have.

Dr. Hewett of Chicago, Dr. DeFord of Des Moines, Dr. Teter, Dr. Hewitt of London, and Dr. Hillischer have all tried nitrous oxid and air. Dr. Hillischer was

the first man who administered nitrous oxid to any extent. Dr. Andrews discovered that nitrous oxid is better with oxygen than with air. Dr. Hewitt discovered that deep anesthesia could not be obtained when over 30 per cent. of air is used. The correct mixture is 92 per cent. of nitrous oxid and 8 per cent. of oxygen. In order to get 8 per cent. of oxygen 40 parts of air must be taken, but then only 60 parts of nitrous oxid are left, which is not enough to deeply anesthetize a patient.

It has been proved that nitrous oxid and oxygen is better than nitrous oxid and air, because it can be absolutely controlled, and the patient can be anesthetized as deeply as you wish. It seems to me that these experiences should be sufficient for us. I have endeavored to get some of my medical friends interested in my experiments.

I wanted to talk chiefly about partial anesthesia. You cannot operate on the tissues under partial anesthesia without pain. If you want to lance a gum or extract a tooth without hurting, your patient must be unconscious, but you can enter the tooth structure without hurting.

A Member. How about removing pulps?

Dr. Gregg. I have done it many times. I had a patient who had only one hour's time, in which I exposed one pulp, took out another entirely—I did not want to remove the exposed one—and also excavated three cavities.

Dr. Hutchinson. How about using this anesthetic in operations for pyorrhea?

Dr. Gregg. I do not believe that it would be successful. It is peculiar that you cannot operate on the soft tissues. I talked to a nerve specialist, and he could not understand how I could cut out a sensitive cavity in a patient who was conscious all the time.

Never give nitrous oxid and oxygen without inserting a prop in the patient's mouth, if you intend him to lose consciousness.

Dr. Teter operates for as long a period as he wishes. In operations on the brain and the abdomen he has kept patients anesthetized for two hours and fifty minutes.

Dr. Van Woert spoke of cataphoresis. Dr. Price made a special cataphoric outfit for me. It will do the work, but what is the use of working for an hour or longer, when you can do the work in a few minutes without cataphoresis and without trouble.

Dr. Van Woert brings up the old argument about a rapidly revolving bur, a sharp bur, and a light touch. You cannot cut out a sensitive cavity with a sharp bur. It will hurt whether the bur is still or whether it is revolving. You may reduce the pain, but you will hurt.

Dr. Van Woert. I did not say it would not.

Dr. Gregg. But you can do it with this anesthetic without hurting. You do not have to touch the cavity until the patient is in a state in which it will not hurt.

I have tried ethyl chlorid. After the topical remedies it was one of the first methods I tried. It is all right on the front teeth, as has been said. It makes the pain bearable, but nevertheless there is pain. Suppose you have a cavity in the third molar. What will you do with cataphoresis or ethyl sprays? They may be used, but the high-pressure syringe will be found to be one of the most wonderful instruments. It has not been given a fair trial. I have one of the first that were sold in Cleveland, but had this one made for myself, because it was a little more powerful. It was designed after Dr. Myers' idea, but is a little more compact and neater to work with; I would not dispense with it.

Dr. Schamberg mentioned a case of a patient who had convulsive symptoms. Dr. Teter and Dr. DeFord claim that there is less jerking and jumping around with this combination, especially when the gas is heated; the patient goes to sleep peacefully. One of the leading nose-and-throat specialists in the West, who is very well known here, is much afraid of anesthetics. I showed him my method in the presence of Dr. Jackson, and he remarked that it was one of the prettiest anesthesias he ever saw.

Dr. Heckard mentioned giving a clinic with an anesthetic. An operator always works under a disadvantage when there are a lot of people standing around and making a noise. The patient is nervous, you are nervous, and are apt to make a failure of it. Dr. DeFord, who is one of the old clinicians, says that he does not dare to give a public clinic with an anesthetic.

In this method two bags are employed, one for nitrous oxid, the other for oxygen. The gas is mixed in a cylinder in the center of the apparatus. In administering the anesthetic for analgesic purposes the oxygen bag is kept extended, while in the other bag just enough nitrous oxid flows in to keep the bag from being entirely empty. The patients have absolute control, a fact which I impress upon their minds. If they feel any pain, they know that breathing a little more will relieve the pain. Often when I want to look in my case for an instrument, I say "Take a few breaths through your mouth."

I also use this mixture for desiccating cavities. Drying a large cavity with alcohol causes pain. You cannot dry a sensitive cavity without hurting.

Dr. Rhein. Am I right in assuming that you do all your preparation without the rubber dam?

Dr. Gregg. Yes.

Dr. Rhein. We have had some little discussion on that point. Personally, I am very much averse to preparing cavities without using the rubber dam. It is not quite clear to my mind whether the application of the rubber dam would make your technique as simple as it is without.

Dr. Gregg. You can put the rubber dam on, if you wish. Dr. DeFord does it. It might give the patients a little less confidence—they might think they could not get air. You can prepare all the sensitive parts, and then put on the rubber dam for finishing. I do not use the rubber dam.

In the case the model of which I passed around there were several cavities along the gum. I prepared those cavities which I knew would hurt very much if I let the patient come out of the anesthetic; I did not have time to insert permanent fillings in all of them, as she had to go back to school. I told her to breathe in a little more, dried the cavities, and put in gutta-percha fillings.

I have experimented with this anesthetic ever since I started in dentistry, about eighteen years ago. I have tried all the sprays and cataphoresis, and now every day when I cut out a cavity I remark that it is the greatest boon. I have had patients leave the chair saying, "Just to think I can have those cavities prepared and not worry about the pain."

I wish I could fully convince you. I can give you addresses of patients—intelligent, well-to-do people.

The only objection which I have against this method is that it is hard to use in children. If you get a child under ten years of age you cannot reason with him. You cannot make them understand that you want to relieve their pain. The youngest children in whom I use it are eleven or twelve years old. It takes more in highly nervous or elderly persons, but very little in the young.

Dr. Tracy sent me a very nervous patient for whom quite a little work was to be done, and who was much worried about one especially sensitive cavity. I assured her that I would not hurt her, and I wanted to treat her before coming here in order to convince Dr. Tracy of the success of this method. The patient had great fear of becoming unconscious, but before I realized it she breathed deeply and became unconscious. She was unconscious for only a few seconds, and I turned off everything, and let her breathe air. I told her that she did not have to lose consciousness, but she did not believe that I could excavate her tooth without hurting her. She said she felt a little dizzy and her hands tingled, but she was simply delighted at the result, and she signed a record stating that this method was perfect.

Dr. Visick mentioned paraform. You must seal-in paraform, and let the patient go for three or four days. Paraform is uncomfortable when it is sealed in the cavity, and you must see the pa-

tient again—all of which takes time. Meanwhile, you could have excavated the cavity with the aid of this anesthetic.

I might have left some things unsaid, but I feel that I should have lost an opportunity if I did not get some of you interested. Stick to this technique until you master it. Several Pittsburg practitioners experimented with it, but gave it up. They had a patient who was a little nervous, and they became frightened. One dentist called me up and asked me whether I was still using it. I said, "Yes." He said, "Every patient I give it to once, wants it again, but I do not like to bother with it." I said, "Why, if they want it again, your troubles are over."

Dr. Van Woert. I move that a very hearty vote of thanks be extended to the essayist, and I want the society to assure him that we are deeply interested in his method, and that his efforts will not be in vain. I also include in this motion Dr. Heckard, for his remarks and for bringing his apparatus here to demonstrate it to us.

The motion was unanimously carried.

Adjournment.

Frederick C. Kemple, D.D.S.,
Editor N. Y. Odont. Soc.

MARYLAND STATE DENTAL ASSOCIATION AND THE DISTRICT OF COLUMBIA DENTAL SOCIETY.

Fourteenth Annual Union Meeting, Washington, D. C., October 28-30, 1909.

Thursday, October 28th.

The fourteenth union meeting of the District of Columbia Dental Society and the Maryland State Dental Association was called to order Thursday afternoon, October 28, 1909, at 3 o'clock, by Dr. A. D. Weakley, Washington, chairman of the Joint Committee of Arrangements.

Dr. Weakley introduced Dr. Charles W. Needham, president of the George Washington University, Washington, D. C., who made an address of welcome to the members of the two societies on behalf of the university, as follows:

Address of Welcome.

Ladies and gentlemen,—I always esteem it a great privilege to extend a welcome to a body of men who are working to improve conditions—social, educational, political, or in whatever field of human endeavor they may be engaged. I want first to express a most hearty welcome on behalf of the city to the representatives from outside. Washington is always hospitable, its doors are always open. It is a place where visitors are welcome—and they are many. There are many things here to be seen, and they are yours quite as much as they are ours who live here permanently. This is the national city; it belongs to the whole country.

One of the arguments which I like to make in regard to education in the District of Columbia is that students come here from every part of the country to study, and stand upon neutral ground. It is neither north, south, east, nor west; it is common territory, and belongs as much to one part of the country as to another.

On behalf of the university, permit me to say that we esteem it a great privilege that associations like yours meet

with us. It is a part of the educational work of the university that national and other associations engaged in different departments of educational work see fit to come here and hold their meetings. So I want all of you who are delegates to this association to feel that for the days you are here you are duly enrolled as members of the faculty of George Washington University, and whatever you do, let it be done from the standpoint of a university trying, at least, to do good work.

As I look into your faces I am reminded that there is and has been for the last few years a strong movement in all of the professions to elevate their standards through higher educational standards in the professional schools. Every profession today has its national organization, with the view of raising the standard of educational work, the ethical standard, and the professional standing of its members. I was very much interested once in going into a great milling establishment and talking with the man at the head of it. I said, "It is a great thing to produce good flour for the people who have to eat it." He replied, "Yes, it is a great thing." I said, "I suppose there are a great many processes?" "Yes, a great many processes, but there are two things essential, the screening and the grinding." I thought of that remark afterward. The miller does not have much to do with the preparation of the wheat. He has to take the wheat that is grown throughout the country and brought to his mill; but the screening and the grinding belong to him. That is true of all educational work, especially all higher educational work. Whether it be a college, a law school, a medical school, a dental school, a veterinary school, there are two questions, two great problems to be discussed, namely, the *sifting* and the *grinding,* if the standing of the profession is to be raised.

Now, as to the sifting. You and I do not have much to do with preparing the young men who come to us for education. It has been very truly said that if you were going to perfect the young man, to make him of the very best quality, you would have to commence about four hundred years back, and see that his ancestry was right. We have to take the material that comes to us, but it is for us to determine how much of that material we will receive. It is our duty to screen it, and to screen it in the interest of the individual, of the educational work, and of the profession which the young man proposes to take up. I venture to say that it is no blessing whatever, but an absolute curse, to allow a young man who is absolutely unfit, to pursue professional studies. He is wasting his time. A certain preliminary education is essential for a man who would pursue professional studies, and it is our duty as experts to determine how much preliminary education a man should have in order to be able to pursue intelligently and well the studies fitting him for a profession. There is probably no more important question that can come before any body of professional men than the question of standards of admission to the schools that are teaching and preparing men for that profession.

In the second place, it is absolutely essential that men be well prepared in order that the work in the school may be properly done. If you have from ten to fifty students in a class, and a quarter or a half of these men are ill prepared to do the work, they are a constant drag upon the whole class. The teacher then has to lower the standard of his work, and he will do it unconsciously, if not intentionally. He will be lowering his standard to the capacity of the poorest men in the class. Education very much resembles a chain; you can measure its strength by the weakest link. If you watch closely you can find that unconsciously the teacher keeps on coming down until he reaches the lower levels in his class, therefore it is essential for good work in classrooms that the students be carefully standardized before they come into the school.

Every school is known by its product. "By their fruits ye shall know them" is not only true of men, but it is equally true of institutions. The product of schools is the graduate, and each school

is judged by its product. If incompetent men are turned out because, perchance, their early education did not fit them to pursue the technical studies required, or because the method of teaching is antiquated, then the standard of the profession is lowered; if, on the other hand, they are well equipped and are graduated with honor, then the standard of the profession is raised. Therefore, in the interest of the men themselves, in the interest of the class-work, and in the interest of the profession, let us see to it that the "screening" is well done.

Next, it is quite important that the "grinding" be well done. In all educational work there are different methods of teaching. I am not going to discuss those methods. There are schools that undertake to feed professional knowledge to men. You might just as well try to make an athlete by lecturing to him as to undertake to give professional training by didactic lectures alone. Everyone grows from within outward; whether it be physical strength or intellectual strength or moral strength, it comes from within. The true definition of education is "drawing out." Emerson said, "The way to get water into the well is to pump water out of the well," and that is true of education; that education which undertakes simply to feed men with a spoon is fundamentally wrong. As your arm grows strong, not by putting it in a sling and carrying it, but by using it, so the intellectual man grows strong by giving forth the knowledge which he has acquired and stating it in his own language. You can never have an opinion until you have expressed it. "We keep the things that we give away;" so in all educational work, the fundamental principle is to grind the product, and grinding it means to make the men work, and not to do the work for them.

I congratulate you upon the success of this association. Let me say that in all your discussions for the uplift of your profession and of humanity, and for civic reforms, two things are absolutely essential. The first is a broad view. It is not a question what any particular school needs; the question is, What is the best policy for all schools? I would put the ideal so high that none can reach it, or that only a very few can live up to it; put up a true ideal, and let us grow toward it as fast as we can. Of course there must be a minimum standard, but take a broad view of the whole subject.

The second essential thing is this: Do not let any selfish interest, whether personal or institutional, enter into the discussion. It has been said, and with great truth, that there is nothing under heaven so sacred and divine that it cannot be spoiled by putting a man into it. That is true. Whatever our work may be, the moment we intrude the man into it we begin to look at it with selfish interest, and spoil the work. Let the *work* and not the man be uppermost always.

And so with great pleasure I welcome you here to this city and to the university; but, most of all, to a broad, intelligent, unselfish work in uplifting the standards of your profession.

Welcome from the District Society.

Dr. J. T. McClenahan, Washington, D. C., president of the District of Columbia Dental Society, then made the address of welcome, as follows:

It becomes my privilege as president to bid you all a hearty and cordial welcome to this our fourteenth annual meeting. We have had thirteen, and they have all been successes, and I see by the program that the present meeting is to be no exception to the rule. I want to insist that every member of the District of Columbia Dental Society make it his special business to see that our friends from Maryland and our guests from other sections are made so comfortable that they will feel like coming back again.

I want to thank our general chairman and his able assistants for the good work which they have done, and congratulate ourselves on the feast of reason that they have in store for us.

Dr. Weakley. We will now hear from Dr. J. W. Smith of Baltimore.

Response to Welcome Addresses.

Dr. J. W. Smith, Baltimore, Md., president of the Maryland State Dental Association, spoke as follows:

After all this speech-making I feel rather embarrassed to attempt to say anything at all, but I assure you that I can express the sentiment of the Maryland State Dental Association when I say that I most heartily accept your kind invitation to be present on this occasion. There is no reason why this the fourteenth meeting should not be fully as successful as the former meetings have been. While not very many members of the Maryland Association are present this afternoon, I have had a report from a number who will be here tomorrow increasing our force. We enjoy being with you very much, and trust that the meeting will be a grand success.

Dr. Weakley. Dr. McClenahan will now take charge and continue the meeting.

Dr. McClenahan. I will only take charge of the meeting for the purpose of inviting Dr. Smith to assume charge for this afternoon.

Dr. Smith (in the chair). Gentlemen, is there any special business to come before the meeting?

The report of the Committee on Arrangements was called for.

Dr. H. C. Thompson. In view of the fact that the committee's work is still in progress, I would move that we defer the report until such time as the committee is prepared to report.

The motion was carried.

Dr. McClenahan. I have been thinking for some time, since I have become especially interested in this union meeting, that we ought to have some permanent organization to manage the union meetings, so that we will not have to wait for an election in one place to know who is going to be responsible for the meeting of next year. I think it would be a good plan to appoint a committee at this time to consider the matter of having an election at this meeting for the purpose of choosing a president and a vice-president who would look after the union meeting for the ensuing year, so that we could elect our president this year from Baltimore and our vice-president from Washington, or some such plan as that, and *vice versa,* as the years go on. I therefore move that a committee of five be appointed at this time to report at some time during this present meeting as to the feasibility of having a permanent organization and of electing the officers at each meeting.

The motion was seconded and passed.

The meeting then adjourned until 7.30 P.M.

Thursday—*Evening Session.*

The meeting was called to order by Dr. J. T. McClenahan, president of the District of Columbia Dental Society, at 8 P.M.

Dr. McClenahan. The first paper for the evening is that of Dr. H. F. R. Snyder of Baltimore, entitled "The Necessity of Educating the Public in Dental Prophylaxis as Against the Pernicious Influence of the Dental Quack's Advertising."

We have with us tonight one of the prominent members of the staff of the U. S. department of Agriculture and chief of the drug division, Dr. Lyman Kebler, who will read an essay entitled "Drugs and the Dental Profession."

[This paper is printed at page 303 of the present issue of the Cosmos.]

Discussion.

Dr. Chas. A. Hawley, Washington, D. C. I am a little embarrassed in discussing a subject with which I am unfamiliar, but I certainly would not miss the opportunity to express my appreciation of Dr. Kebler's paper, and of the work that he and his associates are doing in carrying out the provisions of the pure Food and Drugs Act. I cannot conceive of any other work that is doing as much good for the public or the country at the present time. In our own work we do not use drugs as much as does the medical profession, our work be-

ing essentially of a surgical nature, yet the drugs which we do use should be pure, and the information which the essayist has given us tonight may account in a large measure for the different and uncertain results which we get from a number of them. The essayist did not dwell on the quality of the cocain that is being used by the medical and dental professions, but I can remember very well that when it was first used as a local anesthetic dangerous symptoms sometimes occurred and erratic and unsatisfactory results were produced, probably owing to variations in its quality and adulterations. These erratic results at the present time are somewhat eliminated by the manufacturers themselves. Cocain is only one example of the great harm that can be done by adulteration.

We have another field in which I think investigation would do a great deal of good, and in which we certainly need more exact knowledge, that is, the use of mouth-washes, which we all probably use too carelessly. In all work of that kind we have derived great benefit from the work of this department, and we are indeed under obligation to Dr. Kebler for bringing this matter before us.

Dr. H. J. Allen, Washington, D. C. Dr. Kebler has rendered us a great service by his suggestion regarding the establishment of a medical council somewhat similar to that which is operating so successfully under the auspices of the American Medical Association. I do not hesitate in the slightest to predict the establishment of such a council as a result of Dr. Kebler's suggestion. We as a profession are largely at the mercy of a number of conditions which must be speedily wiped out, and among these is the itinerant drug-vender, who goes around from one dentist to another, telling each one that the other uses and recommends some particular product, and as a rule selling the product that gives the greatest pecuniary return. I have noticed of late years the rather nondescript character of the drugs that are dispensed by these venders.

Another feature to be eliminated, in part at least, is illustrated by a text-book that is very widely used throughout the United States at present. It is a book that has recently been revised, but not revised in the right way. I think it ought to be condemned for having a number of quack or proprietary preparations classified with the official preparations. No distinction is drawn between these, and students do not get the correct comparative ideas. These preparations are all put together, the sheep and the goats, and it is time that such a book be dropped from collegiate lists if it does not show an improvement in the next revision, and some book be adopted about which we know that the author is more than a mere compiler. We want fewer compilers among the authors of dental text-books, and more investigators who find out what they are talking about before they put it in black and white. I do not hesitate to make these statements, because they are borne out by sufficient evidence.

I do not know any better thing that this association could do than to make a recommendation to the National Dental Association that it is the sense of this meeting that a medical council should be organized by the National Dental Association somewhat on the same lines as the council of the American Medical Association, and if no one else takes the initiative, I will, before the meeting is over, make a motion to that effect.

Dr. W. A. Mills, Baltimore. The essayist has opened the eyes of the most of us who have been giving our patients a variety of preparations of whose composition we know nothing. Some of them may have been good, but most of them doubtful. I have always insisted that if you give your patient a remedy, it is only proper to write out a prescription, so that you may know what you are giving. Not many of us prescribe their own medicines, but some of us do, and are doing it intelligently. We should not only know how to prescribe, but we should also know something of the reputation of the druggist who compounds our prescriptions, for the time is coming when we shall be required to do something more than filling teeth.

Dr. McClenahan. I will ask Dr. Carpenter of the navy to discuss the paper.

Dr. Dudley N. Carpenter. I am particularly interested in one part of Dr. Kebler's paper, namely, mouth-washes and tooth-powders. Last summer, at Annapolis, I tried to find out the composition of some of the mouth-washes and tooth-powders which the midshipmen were freely using, as we consider it a part of prophylaxis to look after their teeth. The work of the director of our dental department has been most interesting; for instance, the card index which he keeps, his method of identification of carious teeth and fillings, etc. The subject of tooth-powders and washes had been taken up the year before by one of my predecessors, who had written to some of the firms regarding the composition of their proprietary tooth-washes and powders. He received very few, in fact only two answers, I think, so this year I took up the subject again. A number of dentifrices were already on sale in the midshipmen's store. It seemed to me that before these preparations were permitted to be used, we ought to know what they contained. I therefore wrote to the *Journal of the American Medical Association* asking for information from the council on pharmacy—which we have heard discussed tonight, and which we think is an excellent institution. I received the following letter:

103 Dearborn ave., Chicago,
August 26, 1909.

Dr. D. N. Carpenter, U. S. Naval Academy, Anapolis, Md.

Dear Doctor,—In answer to your letter of the 23d instant, requesting information regarding certain tooth-powders and washes, we are sorry to say that no special work has been done by the council on any of the preparations that you name. We find on file, however, the following information regarding some of the preparations. How accurate this information is we have no means of knowing:

Calox. McKesson & Robbins hold patents on this dentifrice (U. S. Patent 760,397). It is described as a powder consisting of 95 per cent. precipitated chalk; 3 per cent. powdered castile soap; 2 per cent. calcium dioxid, and flavoring.

Sozodont. (1) Powder: Calcium carbonate, magnesia carbonate, orris-root powder and flavoring. (2) Liquid: A solution of soap 5.0, glycerin 6.0, alcohol 30.0, water 20.0, flavoring and coloring. (This from Hager's *Handbuch der Pharm. Praxis*, vol. i, page 556.)

Pebeco tooth-paste. From the *Druggists' Circular*, May 1908: Magnesia carbonate 100 gm., calcium carbonate 100 gm., potassium chlorate 500 gm., sugar 45 gm., water 155 gm., glycerin 65 gm., powdered soap 18 gm., thymol, vanillin, and oil of peppermint in alcohol.

Sanitol. At a meeting of the Harvard Odontological Society G. B. Squires read a paper on the "Nostrum Evil," in which he took up among other things the analysis of Sanitol. He stated that the Sanitol Co. published as the ingredients of their product: Salitrol, limocine formol, plantago majorum, menthol, and spirits of Cologne. He went on to give the result of an analysis made by H. Carlton Smith. Mr. Smith's report ran as follows:

"I have examined the sample of Sanitol received from you, and find it contains salol, formalin, menthol, and alcohol. It does not contain boracic acid, which the label on the bottle gives as one of its ingredients. The literature in regard to this preparation gives two formulas, one with boracic acid and one without. Both formulæ claim that the preparation contains plantago majorum. Plantago majorum is the ordinary plantain, which is supposed to be somewhat astringent and may be present; I know no test for it. One formula mentions 'sanitrol' and 'limocine,' which are claimed to be new synthetic germicides. I am unacquainted with either of these articles and thus far have been unable to find mention of them. It may be that 'salitrol' is a slightly modified salol, but the modification is so slight that it may not be distinguished by chemical tests."

Inquiry of Messrs. E. R. Squibb & Sons as to the nature of "salitrol" and "limocine" elicited the fact that this well-known firm have never heard of their existence.

We are sorry we have no information regarding some of the other preparations about which you inquire.

Yours very truly,
Journal American Medical Association.
(Per A. J. C.)

I simply quote this letter to show how little is known by the medical profes-

sion regarding these tooth-washes and tooth-powders. From casual conversations with one or two dentists whom I know, it seems to me that they are also prescribing in very much the same way as doctors, knowing little about many things. There is one good thing about the service of the army and navy—we are conservative. We do not get hold of these new things, at least we are not supplied with them quite as soon as is perhaps the rest of the profession, and in that way we have a certain amount of safety. During the last five or six years I have been much interested in the reform that is going on. I feel very much as Dr. Mills has said: I believe in writing our own prescriptions, for then we will know what is in the preparations we are dealing with. The Dental Association ought to take up the subject in the same way as we did. We need not disguise the fact that we ourselves have been partly to blame. Prescriptions at every drug store show that doctors have been to blame in the past, and I think we might as well admit our shortcomings, and go about remedying them as soon as we can.

Dr. S. W. Bowles, Washington, D. C. As a member of the District of Columbia Dental Association, I want to thank Dr. Kebler for his paper, also the gentleman who is responsible for inducing him to speak here. He certainly has impressed upon our minds the importance of never using drugs for which we do not know the formula. I have made this a practice in my own work, and have perhaps let go by some good preparations, but I know I have also let go by some bad ones, and I think everyone of us ought to leave with the conviction that we ought not prescribe any drug we know nothing about. The drugs act has helped somewhat in obliging the manufacturers to tell us whether harmful ingredients are employed in preparations and in what percentages, but that is not enough; we want to know everything that is used. Dr. Kebler to me represents a type of American men who are just as much patriots as our naval and military heroes. I have come in contact with a number of other experts in the department of Agriculture, and I know that they are all working at salaries which do not pay them for the good which they are doing for their country. They are working for the love of their work, for the love of their country. I wish Dr. Kebler in closing his discussion would tell us whether he has found in his investigation that sarsaparilla is good for the feeling of fatigue, because if so it should have a place in our cabinets.

Dr. M. F. Finley, Washington, D. C. I want to express my appreciation for the presentation of this subject by Dr. Kebler. I think we need leading in the different directions of investigation. I am much pleased to have had so much elucidation on several topics by this paper and the discussion. It might not be a bad idea for these two associations to take the initiative, as Dr. Kebler has suggested, and to induce the National Dental Association to take up this work. I just now wish to bring to your attention the fact that it was through this union meeting that an effort was started to have the National Dental Association apply for membership in the United States Pharmacopeial Convention. A paper was read by a Baltimore member, Dr. Edward Hoffmeister, and following his paper, I, being that year president of the National Dental Association, wrote to the president of the convention, Dr. H. C. Wood of Philadelphia, asking how we could become members, and if there was an inclination on the part of the controlling authorities to admit us. Recently I have been called upon by the secretary of the United States Pharmacopeial Convention, Dr. Motter of Washington—this convention always meets in Washington and its next meeting will be held in May 1910—and he suggested that we apply immediately for membership, it being necessary to petition the United States Pharmacopeial Convention to change their constitution and by-laws so as to permit us to send delegates. The executive council of the National Dental Association meets on November 6th and the board of trustees of the United States Pharmacopeial

Convention on the 26th. Dr. Motter furnished me a copy of their constitution and by-laws, and I wrote to the chairman of the executive council of the National Dental Association. In his letter of reply Dr. Motter says that he will undertake to induce the council to ask for this representation; he is of the opinion that there will be no question of our being admitted to membership.

Returning to the suggestion of Dr. Kebler, possibly it might be well to have this work of the examination of preparations used in dentistry taken up by the American Medical Association, in which there is a section on Stomatology, they having the machinery necessary to make these examinations. This might be an easier way to get our examinations of the different drugs used started. It is, of course, a decided effort to start the machinery necessary; funds and organization are needed. We might get a start in that way, and offer all possible assistance to that association.

Dr. Kebler (closing the discussion). This discussion has opened up an extensive panorama. In my remarks I simply touched here and there on various points, although I could have elaborated upon any one of them sufficiently to have kept you here for a couple of hours at least. Several members spoke about cocain and its untoward effects in former days. I have given considerable attention not only to drug products containing cocain, but also to beverages containing cocain. I have just returned from Atlanta, Ga., from successfully prosecuting a firm there for sending into interstate commerce a syrup for making a beverage known as "Koca-Nola," containing cocain. If we in the United States have permitted and are permitting the presence of cocain in soft drinks, why should we not expect untoward effects when a dose of cocain is administered? If cocain, mingled with caffein, is liable to be given to every child as it goes to the soda fountain, what can we expect? We should expect untoward effects almost everywhere. That firm pleaded ignorance to the fact that the preparation contained cocain, yet I produced a copy of a letter which the Koca-Nola Co. had given me two years previous, in which the manufacturer of a certain extract of coca leaves that was used in preparing Koca-Nola Syrup stated definitely and specifically that the agent contained a certain amount of cocain. The quality of cocain has been improved during the past few years, but I think the pernicious effects of cocain are largely due to the fact that the people of the United States have been and are now getting a considerable amount of cocain in various ways from childhood up. Two years ago I started to make an investigation of these products, and I was very much surprised to find the number of commodities of this character being dealt out to the people of the United States. We have found that there were approximately fifty soft drinks that contained this deleterious agent; two have already been prosecuted in Atlanta, Ga., and a number have gone out of business. Next week we go to another distant city, where we intend to prosecute another firm. Some of these men seem to have little conception of the untold harm that might result in dealing out a dangerous drug of that character in the form of an apparently innocent drink.

We have done quite a little with mouth-washes, although not as much as we might. Two products are now in the toils; one of them is represented as being harmless, but contains a large quantity of free sulfuric acid. Harmless! That firm will be prosecuted in a short time.

One of the doctors referred to the fact that he probably let go by a number of good preparations because he did not seize the opportunity when they were presented to him. I want to say to him that he let very few good ones go by; most of them are bad. I do not want to represent that they are all bad, but the number of good ones is very small.

I want to drop just a hint in connection with the Council on Pharmacy and Chemistry of the American Medical Association, which might be of service to you. When the Council on Pharmacy and Chemistry was organized, we did

much of the analytical work; we are doing some now. The request was made of the Secretary of Agriculture to do the work, and it was granted. I happen to be a member of that body, and while I am unable to do as much work as I would like, I do what I can. If I could give my time solely to that work, I would be glad to do it; yet I believe my line of work is equally valuable.

Relative to delegates of the dental profession getting representation in the Pharmacopeial Convention, I think that that is very important, for this reason: There is at present a commercial factor at work which is endeavoring to make the pharmacopeia as weak as possible, and for that reason a cohort of stalwart men is needed, men who will stand up for what is good and pure, for the best, so as to be able to check those who would drag standards down in the mire simply for a few dollars. I hope you will push this matter, and secure representation in that convention.

The President announced as the next order of business a paper by Dr. DUDLEY N. CARPENTER, United States navy, entitled "A Report of Two Cases of Dentigerous Cysts."

[This paper is printed at page 283 of the present issue of the COSMOS.]

Discussion.

Dr. A. B. CRANE, Washington, D. C. From my experience with naval surgeons, I have learned that when they make a statement it is always better to think twice before you try to contradict it, because they are trained to only say what they *know*. Through the courtesy of Dr. Carpenter I have had a synopsis of his paper, and therefore what I say tonight I say because I think *I know*.

The first point I would like to bring out is the absolute necessity of the exploratory puncture in all tumors of the mouth. In the case presented the essayist and his *confrères* had about started to make a resection of this maxillary bone. This has been done many times before. In many surgical text-books, operations are recorded in which the mandible was resected owing to a mistake in diagnosis; this seems to me almost inexplicable, since the exploratory puncture will clearly indicate the nature of the growth which is causing the enlargement. If upon puncture the peculiar fluid indicative of cysts is obtained, you know that you are not dealing with any malignant growth and that there is no necessity for permanently deforming the patient.

The second point I would like to take up is the matter of the external incision, and I am glad that the doctor threw down the gantlet. I have looked with the greatest admiration at our eminent surgeons making external incisions, and I tell you privately that I have envied them; I want to make those external incisions myself every time I operate, because it is so nice to be able to control the flow of blood, to not have to stop every two minutes for the reapplication of the anesthetic inhaler, or to swab the blood out of the throat. Yet I do not think that we are justified in cutting from the outside if we can reach the field of operation through the mouth; personally I cannot conceive of any growth of the bone in the nature of dentigerous cysts such as the essayist has operated upon which cannot be reached through the mouth. The surgeon, however, goes about this operation with his Rongeur forceps. I have used the Rongeur forceps, and it is a pleasure to hear the bone snip as you cut along, but we have in our possession the dental engine, in which we can put burs of various sizes and shapes, and there is no bone in the world that can stand the drill of these burs if we apply the proper power on the engine. Therefore, if I were to criticize Dr. Carpenter's operation, I would criticize that incision which he made along the border of the lower maxillary bone.

I wish the doctor would elucidate a little more another point about that secondary operation, namely, the length of time he waited for that deformity to disappear. It is peculiar about dentigerous cysts that after the exciting cause has been removed, the effect, in the majority of cases, very gradually also disappears,

and it is a question in my mind whether, if the essayist had waited longer, the necessity for a secondary operation would not have been entirely eliminated.

From his paper I gather that in the second case which he cited he operated entirely within the mouth and removed the coronoid process of the inferior maxillary bone. If he can reach that far in the mouth by operating through the buccal orifice, he ought to be able to reach almost any part.

The doctor has been very fortunate in having two cases of dentigerous cysts. They are, indeed, very rare, and his results seem to justify his operation in spite of anything I may have said seeming to deter from it.

Dr. Wm. A. Mills, Baltimore, Md. Odontomata, or teeth-cysts, are "composed of dental tissue in varying proportions, and in different degrees of development, arising from teeth-germs or from teeth still in process of growth." Teratomata, or dermoid cysts, often contain teeth or numbers of teeth, also hairs, etc., and may be wholly or in part encapsulated; but they differ from the odontomata in that they are of congenital origin, and are never post-natal.

The former are classified under the following heads by Sutton: "Epithelial odontomes spring from the enamel organ. Follicular, fibrous cementomes and compound follicular odontomes spring from the tooth follicle. Radicular odontomes spring from the papilla, and composite odontomes spring from the whole gum."

A dentigerous cyst, or follicular odontoma, is in nearly all cases caused by teeth—principally the third molar—during their process of development being abnormally situated, and at a time when the osseous tissue builders are very active; not being able to normally erupt, they become incased in bone, there to remain latent for years, or during the life of the subject—for they rarely suppurate—only to be discovered by post-mortem examination. But when such a cyst appears it originates through the absorption of the remains of the dental capsule, thus leaving a space between it and its matrix, which becomes filled with serous fluid, and that in turn becomes infected; then follows a slow and painless edema, or swelling of the surrounding bony structure, until the contiguous parts become so thin that they crepitate upon pressure, and if left without surgical interference will break down at their weakest point and discharge a pus rich in cholesterin.

In many cases tooth-tumors produce such alarming enlargements of adjacent tissues as to cause great distortion of the features, and through false diagnosis as bone cancer, etc., some surgeons have unnecessarily sacrificed much structure, leaving the patient disfigured for life.

But a short while ago I had a case like that of the essayist. The patient was a man sixty-two years of age, who had been treated by a dentist for necrosis, and by another very prominent dental practitioner for the same trouble. The latter, after curetting, etc., and giving no relief, gave up the case, when the patient sought the advice of one of the best surgeons in the city. He treated him for several months; for what, the patient said the surgeon did not seem to know. One day he would intimate that it was cancer, another time tuberculosis, but he always insisted that the patient should go to a hospital and have the growth (?) removed. Someone recommended me to him. He came, the left side of his face presenting an alarming appearance. At first I thought it to be a case of "lumpy jaw," but as soon as I examined the pus issuing from the fistulous opening inside the mouth, I knew my case—somewhere in that monstrous lump of swollen tissue a tooth must be found. And it was found and removed, whereupon the patient made a rapid recovery. He told me that for six months or more he had had no peace of mind day or night. He bought costly books on cancer and tuberculosis and read them through so that he might know of his chances for relief.

On another occasion I had a patient all of whose teeth had been removed, and who said that she had a tumor in the roof of her mouth directly on the median line of the two palatine bones. Following my usual plan, I immediately took a very

long, slender, sharp-pointed, tempered steel instrument with which I can perforate almost anything. You make no mistake in your diagnosis when you do that. When I strike something which feels like a piece of soft wood, I know that dead bone is present. If I strike something like this [indicating the blackboard], I am likely to have living, bony tissue, but when I strike something like this [indicating a smooth surface of glass], I know that it is a tooth. I treated this patient and extracted a fully developed canine. This patient had been wearing artificial teeth for twenty-five years, and did not remember at first that a tooth had been missing in her natural set. Finally, however, she recollected that one of her canines was missing when she was a girl. So in this case there was a perfectly developed migrated tooth that had caused a dentigerous cyst.

I recall another case of a man who had been under the treatment of a surgeon for a long time for what was pronounced to be cancer. The patient brought his child to my office to have a tooth extracted, and he asked me to examine his mouth also. I took my exploring instrument and ran it up to feel whether the growth was hard or soft. I struck something that I knew was a tooth. I dissected back the mucous tissues and exposed the process, after which I removed a bicuspid. This patient was to be operated upon the next week by a surgeon who was to remove what he supposed to be a lot of dead bone—and what would have been the consequence had he gone to the hospital?

Here is another mistake surgeons make. When they find such a tooth they say, as my good friend the essayist has said, that it was *decayed at the roots!* In such a tooth the roots are not fully formed, because full development was retarded or prevented by pressure. Nine times out of ten these teeth have an uncompleted root or roots, and if the roots are fully developed the tooth must have migrated and been compelled to erupt in an abnormal position.

There is a conflict in the statements of surgeons and dental writers. They say that nearly all these cases have occurred in the lower jaw. I have, however, found most cases in the upper jaw, showing that we cannot always abide by any certain rule.

It is not necessary to give you an account of other tumors that come under the head of tooth tumors with which the dental practitioner may have to deal. It has been shown very convincingly that in every medical college a chair of oral surgery is needed, and the sooner such chairs are universally established the better it will be for both the medical and the dental profession.

Dr. Grady. I would like to ask what the essayist's experience has been in regard to the use of the dental engine in trephining the jaw. I think it was tried for a while and discountenanced.

Dr. Carpenter (closing the discussion). In closing the discussion I want to express my appreciation, particularly, in regard to the suggestion for exploratory puncture. That is a most valuable suggestion and one which we should have followed. I am, of course, only speaking in view of these two cases. My experience with dentigerous cysts has been limited. I should think, however, judging from the nature of these cysts and from the character of their formation, that the question of exploratory puncture would present certain difficulties. In operating in cases of liver abscess, for instance, we use the exploratory puncture very often, but just where to puncture and find that pus is not so easy to say. I should think, for instance, if we knew the situation of the displaced tooth, it would be very easy, perhaps, to use the needle and make a differential diagnosis. Otherwise, perhaps, an exploratory incision might have to be made. Ordinarily, I think the surgeon would not care to make an exploratory incision in the mouth on account of the question of sepsis, especially if he had to make an external operation afterward.

Regarding the time allowed to elapse between the two operations, I would say that my idea was that a dentigerous cyst, after the tooth was removed and the cystic tissue had been scooped away very

thoroughly and completely, would collapse, if one waited long enough. I waited two weeks in this particular case, and with all due deference to Dr. Mills, cannot see how the wall of that cyst, which resisted chisels and the trephine, could have been absorbed, or how it would have been possible for this roof of bone, that was like ivory, to collapse.

Ordinarily in our hospitals we have no dental engine. We use it occasionally, particularly in operations on the skull, but after reflecting the periosteum. You speak of operating in the mouth in a case of this kind. This cyst had an ivory-like roof. It seems to me that the external operation was the best because I reflected the periosteum on either side; the periosteum was sutured after I had removed the wall of bone. Later on the periosteum that was left was bound to offer some help in strengthening the remaining internal plate of the bone. If you can remove such a wall of dense bone with the dental engine by operating inside of the mouth without cutting the periosteum, I should like to see it done. I do not believe that it is possible. I should like to see performed in a similar case this internal operation that you describe as being done so quickly and with such facility, and I should be glad to be convinced that my method was incorrect, especially if the bony roof could be removed by the dental engine without destroying the periosteum.

In this particular case, after the first operation I believed the chance of its collapsing to be absolutely impossible, and in the second operation I do not believe that you could have used a dental bur and saved the periosteum.

Dr. A. D. WEAKLEY, Washington, D. C. Before we adjourn I take this opportunity, on behalf of the society and the committee, to thank these three gentlemen for the able papers which they have presented to us tonight. I make a motion that the thanks of the joint meeting be tendered them.

The motion was seconded and unanimously carried by a rising vote, after which the meeting adjourned until Friday, October 29th, at 10 A.M.

(To be continued.)

NORTHEASTERN DENTAL ASSOCIATION.

Fifteenth Annual Convention.

THURSDAY—*Morning Session.*

THE fifteenth annual meeting of the Northeastern Dental Association was called to order at the Churchill House, Providence, R. I., Thursday, October 7, 1909, by the president, Dr. J. E. Power, Providence, at 11 A.M.

On motion the reading of the minutes of the last annual meeting was dispensed with on account of their having appeared in the published Transactions.

Dr. F. T. MURLLESS, Jr., treasurer, presented his report, which on motion was accepted.

The next order of business was the reports of committees.

The editor, Dr. MANSON, reported that the proceedings of the last meeting had been published in due form by the publishers of the DENTAL COSMOS, and copies of the proceedings sent out to every member; also that, as in the past, the editor of the COSMOS had sent Dr. Anthony to report the proceedings of this meeting.

Motion was made and carried that the report be accepted.

The Clinic Committee, through Dr. CROSBY, reported the printed program of clinics as the result of their efforts.

Dr. KINSMAN, secretary, reported that he had received letters from Dr. Stockwell and Dr. Mound in acknowledgment of the courtesies of the society during the last meeting. Dr. Kinsman also read a communication from the National Dental Association in regard to the journal that the society proposes to publish.

Motion was made and carried that this communication be taken up at a later session of the society.

Motion made and carried to adjourn until 2 o'clock.

THURSDAY—*Afternoon Session.*

The meeting was called to order by the President at 2 o'clock Thursday afternoon, October 7, 1909.

Dr. KINSMAN, secretary, read a communication from Governor A. J. Pothier expressing his regret at being unable to attend the meeting.

The president, Dr. Power, then introduced Hon. HENRY FLETCHER, Mayor of Providence, who welcomed the association on behalf of the city of Providence, as follows:

Mr. President, ladies and gentlemen, —It is always a pleasure to welcome to the city of Providence leaders in professions which affect the health and well-being of our citizens, for health transcends all other considerations, and wealth without health is of little value to the individual.

Inasmuch as this convention contemplates the discussion of questions which bear closely upon the public health, it is of special significance, and promises to result in an increase in the sum total of such scientific knowledge as, in exemplifying the old but ever-pertinent injunction "Know thyself," will promote the protection and preservation of the individual life.

The intelligent consideration of problems that relate to the care and treatment of the teeth, those indispensable parts in the machinery of the human body that reduce to its proper condition the fuel that feeds our frames and keeps the mechanism in continuous operation, cannot fail to be of great value to humanity.

If I am correct in my anticipation of the results of your convention, then I am fully justified in thanking you for selecting Providence as your meeting-place. I wish you all success in your deliberations.

Dr. JAMES MCMANUS, Hartford, Conn., was called to the chair and the president, Dr. J. E. POWER, Providence, R. I., read his annual address, as follows:

PRESIDENT'S ADDRESS.

Besides our duties as dentists, there are the large lines of life that begin at the doors of our laboratories or dental offices and radiate all around us. The dentist is as much in duty bound to look to the life that is lived by those around him as is the doctor, lawyer, or clergyman. His profession is rapidly rising in the world's estimation. As he reaches out farther and farther, conquers wider and wider realms of thought, power, and knowledge, he realizes his responsibilities to society; that great, complex society is calling to him as it has called to others.

The mightiest forces operating in society are the home, the school, the church, the neighborhood, the press, the legislature. To all of these the dentist can turn no deaf or indifferent ear; he has responsibilities toward all of them.

THE HOME.

The basis of all that is best in our civilization begins, as a rule, in the home. Indeed, the home itself is the basis of society, hence of civilization; anything that helps the home helps civilization; in an effort to lift up the one, the home, we are making an effort to lift up the other. In finding a way to cement the one, we give the world its best guarantee of the perpetuation of the other. Besides caring for the nation's teeth, the dentist wants to work for such success in the nation's life as will help to make our homes all that they ought

to be. This is what was meant by the men who answered, "Am I my brother's keeper?" with the cry, "Yes, you are your brother's keeper."

What is the home? I hesitate to attempt to define the meaning of that most sacred word. If we accept it in its largest and broadest interpretation, we will agree with the little boy who said, "Home is where mother lives."

Home is a place consecrated to the love of one woman for one man and of one man for one woman, and to the love of both for little ones, if the home is fortunate enough to have such.

THE SCHOOLS—EDUCATION.

After the home come the schools—education. No man may neglect these and truthfully lay claim to the title "good citizen." As they mean so much more in a democracy than they do anywhere else, we are in duty bound to do all in our power to make them what they ought to be. That they are not such now, in spite of the millions poured out to make them the best in the world, is apparent on all sides; from Dr. Eliot down, they are being announced—or denounced—as inadequate.

No nation spends so much money on education as we spend here. Indeed, it is doubtful in my mind whether Germany or France or even England spends as much money to maintain the army, navy, and school systems as is paid in this country for education alone. It is no part of my purpose to paint a picture of what our education was in the past, what it is now, or what it is likely to be. My purpose is to point out the duty of dentists in regard to the public schools, including the state universities and other institutions stipended by the state. We should be on boards of education; we should call attention to evils in system, if any are detected. We should encourage the cause of vocational or industrial education, we should stand for the highest and best and noblest, we should see to it that each boy and girl—beings of physical, moral, social, intellectual, and esthetic powers—has a chance to round out these powers to their most perfect fulness. We should try to find out what forces and factors helped to make Germany and Japan so successful, and end by adopting the same means and methods. If we are to become adepts, we must adopt and adapt the methods that have meant so much to others.

THE CHURCH.

What is our duty to the church? Each will have to answer that in his own way. The Jew has as much right to be here as has the Gentile. We are all one people, children of the one God, Jehovah. Let us help the churches, the temples, or the synagogues; let us help so to interpret social duty and social responsibility that all will feel free, that all will feel about them an air or atmosphere of fairness—that is only what is called fair play. Let us try to make the work of the churches, temples, and meeting-places as successful as it is possible to make such efforts. If the church is of wood, and a people's faith, the full flowering of a pure faith, service, and sacrifice leads them to make it marble, let us rejoice, let us aid and encourage their efforts. Churches are as great civic forces as are the schools. Bad citizens are not the best members of religious bodies, and conversely the best members of a church are not the worst citizens.

THE NEIGHBORHOOD.

We are prone to procrastination when the matter before us does not affect us directly. If a man is a member of society he should act as such, interestedly and intelligently. The sewerage, the water, the means of transportation, the cleaning of streets, the putting up of signs, the putting up of ugly buildings, the permission to establish nuisances such as often involve the ruin of a neighborhood, are things that should concern us, things in which we should be interested. We have an interest in our homes, in our schools; we should have one in the neighborhood, for it too is a mighty force.

THE PRESS—AMUSEMENTS.

Perhaps of all the world's inventions, the alphabet and printing press were the greatest. The power of the press is enormous. It is to the intellectual or spiritual sphere what the lever was with which Archimedes boasted he could move the world, would someone find for him a place upon which to stand. If the press is bad, or, to put it mildly, by no means what it should be, who is to blame? Do we not get as good as we deserve? Is it not true that the press transmits to us what it thinks we want? Is its function that of furnishing pure food, what our mental and moral natures need, or is it another medium for the accumulation of mere money, at a sacrifice of ideals? Under these conditions, is it not right to regard it as hostile to our hopes, false to our ideals, if it fails to furnish that which we desire?

This problem of the press is a great one, but I believe that we have power to make the press better. All we have to do is to make known our desires for a better, a higher type, refusing our aid to papers and books that purvey the prurient and putrid. It is a well-known fact that the physical appetite is capable of being trained to a fondness for false, vicious physical foods; so too with the mind. If it ever acquires a taste for the vile, the vicious, and the low, it will be hard to lift it back to a fondness for the good, pure, beautiful, and true.

If you ask, "What is possible to us?" I answer, "Much." We can help to cultivate a taste for what is best by buying and having in our parlors or reception-rooms the best papers and books—no others. We can put up our hands and voices in effective protest by avoiding the society of such as seduce the young by viciously purveying to the sensual and base. No, what *one* does is not much, it is true, but we are *many*. What we do by a concerted effort will count against the evil and for culture.

LEGISLATION.

It should be part of our policy to help to make law and justice synonymous; that they are not so now is evident on all sides. If men like Judge B. B. Lindsay, the boys' friend, of Denver, Col., can say that "the men at the head of most of the public service corporations of the cities are the most dangerous criminals in this country," it is time for new minute men to be at modern Bunker and other hills. I do not believe all that Judge B. B. Lindsay says, but I do believe that our politics are in a pretty bad way, so bad, indeed, that a political Hercules will have his hands full in cleaning out our political stables. If there is to be a "majesty of law," there will have to be a "majesty of men," a "majesty of the professions." As high as we hold our heads as individuals, as high as we hold our heads as professional men, so high will we be able to force others to raise their standards. In this country, for good or for evil, we get as good government as we deserve, no better, no worse.

In political conventions it is often asked, lest leaders fail to appreciate the value of the rank and file: "What are we here for?" I might ask that question did I not know your devotion to duty. No man is here for a selfish purpose; no man is here today except at more or less of a financial sacrifice. We are here to take counsel together toward another year's work. We are here to gather from the rich, ripe experience of the best men in our own ranks.

This convention is not a social gathering; it is a postgraduate school, a university extension class. Like bees laden with honey returning to the hive, the leaders in our profession come here to pour forth for our benefit, yours and mine, the best results of the best years of their whole life's work. This is the spirit for which we all stand, the spirit that consecrates a life to loyal service in any profession. It is a life of such service that was in the mind of Christ when He spoke of sanctifying Himself for others.

We, too, may say, Why do we come here? To sanctify ourselves that they who are in our profession, even those who do not come, may be sanctified, may ded-

icate themselves anew to the high ideals held up to us at college.

One is never his best for himself alone. No man liveth for himself; others are interested in him. No man dieth to himself alone; others are interested in our lives, are affected by them. Cain's curse and Cain's answer are ringing in all the aisles of time. What Moses said on Sinai is moving millions now as much as it moved men in his own day. No man can escape the responsibility that attaches to citizenship in the republic.

That aside, patriotism, love of country, devotion to society, are a duty. If there are evils around us, and no effort has been made by us to hinder their arising or to eradicate them, we must hold our peace when charged with remissness. How many of us could hope to go on successfully did we neglect to keep up with the dental work done by others? Where can we hope to hear so much about the advances made in the profession as here, from the lips of our leaders?

If I have spoken strongly, I have spoken truly about the value of this convention as a kind of postgraduate course. Much as it means to us dentists, it should mean as much or even more to our teachers; they, too, should be here. The best schools are those that combine theory with practice. The best law, medical, and dental schools are those into which men go from the bar, bench, physicians' and dentists' offices to teach. To deny this is to deny what we all know to be true. When leading practitioners come from far-off places to give a clinic, to demonstrate, to show how they have proceeded in strange, ugly, or aggravating cases, even instructors should be on hand to be shown what is new or to be confirmed in the belief that what is old and tried is still the best. Ours is a constantly advancing, consequently a constantly changing profession; it is a technical profession. Mechanics, manual dexterity, the use of implements play a most important part in it, and the processes and tools are constantly changing. Better and better methods are being introduced. A single convention can convey more to a teacher than a course of six months in his room can give to a class.

If a teacher is bent upon the merely academic to the exclusion of the practical, he must not feel badly if his fellow-instructors who come here and well-informed practitioners refer to him as being narrow. Many of our professors are not the leaders in the profession, as it seems to me they should be, and as they are elsewhere, notably in Europe. Professors teach the beginners; the candidates for professional recognition or honors, the men who come here in order to demonstrate, to give clinical exhibitions, do so to fairly well-trained, more or less experienced men. Indeed, it not infrequently happens that the honor of hearing the ablest men in other lines is accorded us. What was it that made it possible for Pasteur to paint the name of his beloved France in letters of gold against the sky where all the world was wont to gaze and wonder? It was his work as a clinician, if I may refer to his experimental tests before the most enlightened bodies of Europe as such. If you take me to task, telling me that there is no comparison, I take issue and tell you there is. No work that concerns human health is insignificant. I salute with humble reverence men who have helped me beyond words to express by the clinics that I was privileged to attend; I owe much to them, much more than I can ever expect or even hope to repay.

It might not be a bad idea to teach the heads of our dental colleges and their assistants who do not care to come to our conventions a good lesson, by urging candidates for the dental profession to go to such colleges as send their men to us. The college cannot get along as well without us as we can get along without the college. He who is not willing to learn, the professor who is only a book-man, is, in my opinion, unfit to teach. They who confine their work to the text contained in a book or a bookshelf of books, I care not how good and full it is, are lost; so, too, are the students foolish enough to rely on such a teacher.

DEGREES.

The most dangerous, delusive, debauching and degrading practice in American educational life, against which conventions of this kind can or might effectually protest, is the practice of granting unearned degrees. The unearned increment, railed at by economists, was never half so unreasonable as the degree-granting carried on in this country. The measure of a man's capacity is not a degree, never was and never will be; it is his work, his skill, his acquired capacity. To get a degree without work is to get goods in a confidence game, is to get goods under false pretences. To buy a degree is to sell what ought to be worth more than all the degrees on earth, one's own self-respect. Alas! Degrees *can* be bought, *are* bought, sometimes with gold, sometimes by setting into motion a complex mechanism which for lack of a better name we will call influence.

ALMA MATER.

It is often urged in politics that one is to stand by his country, right or wrong. It is said that all is fair in love and war. Neither of these sayings is sound; both are bad morally and politically. To say nothing succeeds like success is to take a very narrow view of success, a very narrow view of life, for oftentimes nothing fails like success. I remember the case of a boy whose mother wanted him to conceal a serious defect in a horse until the horse was sold. Did he? No! He sold the horse at a sacrifice after pointing out its defect. An alma mater that would want her children to win by ignoble means is not an alma mater in the best sense of that word. I would rather go down to defeat in every game than win one, even the most important, by a mean act. Yes, a man might easily prefer to be right to being president, if being the latter involved a taint of wrong. Ideals such as those which I have only too imperfectly described are sometimes difficult of realization, for they are evidence of that sincerity and high seriousness of which Matthew Arnold, the apostle of culture, says, "To strive, and even to suffer, were a privilege."

If my alma mater, Esau-like, is ready or willing to sell her soul for a mess of pottage, loyalty, aye, even love goes by the board. We cannot afford to stand, gentlemen of this convention, for any dentistry diploma or degree to which a breath of suspicion can be attached, against which suspicion can be breathed. No man must stand for, defend, or encourage colleges known or found to be unfair.

I was told once of a German to whom a reward for excellent conduct had been offered, drawing himself up and refusing the purse. "But no one will know it," said his tempter. "Ah, yes, but *I* would know it," was the answer, Yes, yes, that was it, *he* would know it. Is it ever possible for men to be mean, to do the things I am trying to condemn, and not know it? Let us hope that it is not possible.

READING.

I come now to a delicate question in dentistry. What shall be read, how often, and how much?

First: Read the best writers, and read them over and over, rather than read every didactic dental doctrinaire that is eager to get into print.

Second: Read as often as you can without neglecting more important duties. Read not only dental magazines, *i.e.* magazines dealing with or devoted exclusively to our profession; read in or on other lines, kindred if you care to and must, but for my part I would urge reading wide away from dentistry, say poetry or the great romances of the world's literature. I would urge a course in contemporary history, in sociology, in economics, in the large subjects that affect our life as a people. Nothing in the world of interest to men and women should be allowed to lie outside the range of our reading.

STATE EXAMINATIONS.

I would urge that we stand for the highest type and strictest enforcement

of state examinations. I would raise the standard of professional duty, its ideals and ethics, so high that no man would dare to deliberately try to tamper with either. State boards of examiners ought to be men of the finest moral fiber, the highest type in character and ability. The octopus of politics should never ensnare them. It should always be remembered that the state boards of examiners are or ought to be a protection to the profession as well as to the public; the right kind of a board will be. If we are to lift our profession to higher and higher public appreciation, we shall have to co-operate with the board in sifting out the incompetent and in securing the competent, the men willing to show you that they are competent, but who are willing to co-operate in every way with the boards. If bad men, by underhand methods, manage to get on the boards, they ought to be exposed.

An organization like ours should never shut its eyes to any evil affecting us as a profession in any way, nor should we shrink, as an organization, from that kind of conduct, not only to be condoned, but for which we shall or should receive the congratulations of all good men—the conduct called for when treacherous men use a board or any means to lower the standard that should be the aim of the board and which should be emblazoned on the banner of our organization. Our motto should be that of the Old Guard of Bonaparte, to die first, to choose death in preference to dishonor. It is wonderful what a body of united men can accomplish; team work, even in big organizations like this, tells. No board will ever dare to do wrong in the face of a forceful public opinion roused to action by the rallying cry of this body. You know this, gentlemen. Then let us link ourselves together for this laudable public purpose; let us, as an organization, live up to the ideals that measure our lives as individuals.

I pass now to the pioneers, the trail-blazers, the mighty men of other, darker days. What shall be said of them here today that has not been well said, better said, by so many of our predecessors? But something must be said, however humble or inadequate. There are hallowed names in our halls of memory, men whose life-work was done on large, on lofty planes of thought. Generous men, they made straight the crooked ways, they made easy for us what had otherwise been hard. Were this a banquet board, and were wine in our glasses, I would ask you to drink, lovingly, to the giants of other days, to the good and mighty men of dentistry's early days. God bless them, and make us worthy of their memories!

A CHAIR IN A COLLEGE.

I turn now to another delicate and difficult part of my task, to a definition of my purpose. Why did I say so much about our civic duties? We are citizens. Life is more than the meat we eat or the raiment we wear; life is all that I said it is. We are members of society. This land of ours is, in our opinion, yours and mine, God's country. We must help to keep it so; the fathers made it such. We must put chairs in colleges, even in our dental colleges, if you will, to give courses in civics, in citizenship, to candidates for dental honors. How may we otherwise hope to obtain the high type of citizen for which you and I ought to stand?

If we are not on the heights we are on the way up. How high, half, a quarter way, I dare not say. Brown college, dear old Brown, that has stood for all that is high and noble in education in the past, is holding out her hand to help us. There has been no coming down; she is still where she was. She holds out to us today a venerable hand of welcome, and we, her guests, thank her for her hospitality. Art and science are seen to be sisters, almost twin sisters. The philosophers of all kinds are ours. The treasure-house that holds the golden store of Homer holds also the triumphs of Heron and Archimedes, the splendid triumphs of the world's Pasteurs, Du-Bois-Reymonds, Virchows, and Kochs.

The dream of the Hindo who saw scenes of savagery followed by scenes

such as no artist ever painted, no poet ever dreamed, has had its fulfilment. Under the microscope of the biologist is evidence of God; in front of the space-annihilating telescope God is found again. Homer is holding the hands of the ship-builders, the bridge-builders, the electrical engineers, the wizards whose wands are as wonderful as those who have wielded words as weapons against wrongs or as instruments of progress.

Discussion.

Dr. A. J. Flanagan, Springfield, Mass. It has been a matter of general knowledge to us in the past that the average dentist was considered as a man who lives completely and totally in a tooth. In a more polite way, he has been considered as being fairly strong in his vocational work, weak in his cultural efforts. Is dentistry confined, or should we confine our efforts to that little something called a tooth? I have listened to a great many addresses in the past twenty years, and in my humble opinion we have had today something far beyond the tooth. It is time now to give credit to a movement that is fast gaining strength, a movement which demands that successful practitioners of dentistry be endowed with special culture. What is culture? We are led to believe, in a foolish manner sometimes, that culture comes only to those who have attended a college and have had some higher education, and yet if you will study the history of the world you will come to the conclusion that the men that have moved the world, that have accomplished most good, that have done the most for humanity, have acquired culture not exclusively, in fact many times not at all, from a college education. It lies within the possibility of every practitioner to put himself in touch with the higher things of life. Frequently people form an estimate of a collective body from one individual. If in a town meeting, for instance, a lawyer or a physician takes the floor, speaks intelligently, serves on committees, accomplishes something for the community, is it not natural that the collective body is elevated because of the effort of the individual? Now, cannot we too do the same for dentistry by educating others? We seem to have been asleep. The questions of hygiene, of boards of health, of biology, as presented at the present time—are there not a thousand and one things that the dentist could do and not only help himself but that which he represents, dentistry?

Dr. N. A. Stanley, New Bedford, Mass. The one thought that ran through the whole discourse and which impressed itself upon me, was the fact that we are representatives of a great profession and that we have to perform a duty in the community as citizens outside of that profession. It is not necessary that a man should have a college education to develop what is in him. To be sure, such an education aids a great deal, but if the ability is not in the man, no educational institution can instil it into him. It is a broad view of life that develops a man and gives him his standing in the community, and the dentist of the future must take his stand as the representative of a liberal profession.

Dr. Henry McManus, Hartford, Conn. It is essential for the proper consideration of a matter of this character that it be referred to a committee, and before making a suggestion or proposition I want the privilege of congratulating Dr. Power on introducing a new and interesting element into dental meetings. I have had the fortune, or misfortune, of hearing many presidents' addresses, and I am not stretching the truth when I say that Dr. Power's address is the best that has ever been delivered before this society. Many speakers may have excelled in giving suggestions as to what the society should do, and their suggestions have been referred to committees and put into operation and have been of benefit to this society, but Dr. Power has gone farther than that, telling us what each individual should do not only for the benefit of the society, but for the benefit of the profession and the community.

It is a universally recognized fact that men who work in detail come to see

everything through the lens of a microscope; the man who works on such a small object as a tooth thinks that the entire world revolves around that tooth. If he gets out into the world with its many interests the world is surprisingly willing to receive him and take advantage of the detail of technique which makes a man successful in dentistry and in other lines. Dr. Power is right when he says that the dentist should engage in education and in politics; both are admirable. No profession in the world is devoting so much time and attention to the consideration of education as is the dental profession, and that same love of detail when put into operation on a school board brings a wealth of new and valuable ideas and suggestions into the schools.

The dentist by nature and association is more or less of a handshaker; he has to be, and that policy put into practice in politics will make him successful. I can recall many members of the dental profession who have served the city of Hartford well as councilmen, and four of them have served the city as mayors. Dentistry will never attain the status which it desires and deserves until the individual members show that they have that broad culture which, unfortunately, they have not had in the past.

Coming back to my original motion, I think the President's address should be referred to a committee, and this society should put these suggestions into practice.

Dr. Flanagan. I want to speak of one phase of the subject that comes under the head not of high thinking, but of practicality. In one of the states which make up New England, a law exists which permits a person not graduated from a dental college to take the licensing examination for the practice of dentistry in that commonwealth. I believe the same condition to exist in one or more of the other states. For some years it has been a known fact that men who took the dental examination of the state referred to have signed application blanks stating that they have been in the employ of John Jones, dentist, for so many years, which is all the dental education that they have had. They have not obtained their education in theory or practice in California or in the Philippine Islands, for they put down in black and white that they have been studying and practicing dentistry in the office of a dentist in that state. Now, the commonwealth has a law which says that any person who steps to a chair and examines or causes to be examined the mouth, or performs an operation in the mouth, is liable to the law; yet a person can go before the state board and put on record the fact that he or she obtained all knowledge and experience of a dental nature by violation of the dental law. Someone may say that he or she could obtain the practical knowledge of filling teeth by working on models, thus not violating the law. I ask, is there an intelligent practitioner of dentistry present here today who imagines for one moment that a person could perform before a state board for the first time a creditable operation in the mouth after he has been working solely on models? We know that this is impossible. Cannot, should not, action of a legal nature be taken against these self-confessed violators of the law? In some cases men, having applied for examination and being delayed by a lack of patients on whom to operate, have excused themselves to one or more of the members of the state board by saying that they could not wait any longer because they had an engagement with a patient for that afternoon. What have we done for this condition, gentlemen? It is getting to be serious. Some may ask the percentage of non-graduates who pass the board. It is true that this percentage is very small, but the principle is at issue. Many college graduates find it hard to get a practice, while at the very next door there are practitioners who are using unlicensed men to fill their pockets.

It seems that we know these conditions, and yet we tolerate them. Something should be done in the states where such conditions are on record. Suppose an applicant for medical examination came before the medical-board examiners

of the very state referred to recording on his application blank the fact that his sole medical knowledge and experience was obtained from a Dr. Jones, who conducted a private hospital, where the applicant prescribed and treated patients contrary to the law. This would surely be the undoing of the applicant for a medical certificate in that commonwealth. Is dentistry of such small importance and of so little worth in the estimation of the public that we cannot take action?

Ex-mayor P. J. McCarthy, Providence, R. I. When I came here to listen to the proceedings and to the address of Dr. Power, whom I have the honor of knowing very well, I did not expect in the slightest the honor of being called upon to speak to you.

In the first place I will say that I owe the dental profession a large debt, because I have not patronized any dentist. I fortunately inherited a good set of teeth, and I think anybody who has a good set of teeth has other good qualities —physical qualities to say the least. There is hardly any profession that is more useful or confers greater benefits on the human race than dentistry, yet in my opinion the people know less about the advantages of the proper care of the teeth than they do of any other thing that contributes so largely to their physical and mental well-being. I will venture to say that among the mechanics, the laboring classes, and the farmers the tooth-brush is very rare. The dentist, giving special attention to such matters and knowing the advantage of the proper care of the teeth, and the wholesale ignorance of the people with reference to the advantages of such care, is to blame for "hiding his light under a bushel," for not proclaiming in the highways and byways what the people need in regard to the care of their teeth.

In conclusion, taking up the thoughts suggested by Dr. Power, I would urge the dentist to go out among the people, mix with the people, participate in public affairs, and thus give us the advantages of their knowledge and culture for our mutual benefit.

The president, Dr. Power, resumed the chair, and announced as the next order of business a paper by Dr. A. W. Doubleday, Boston, Mass., entitled, "The Chemical Changes of the Foodstuffs During Digestion."

[This paper is printed in full at page 285 of the present issue of the Cosmos.]

Discussion.

Dr. J. P. Buckley, Chicago, Ill. I hardly feel that I have had sufficient time to collect my thoughts since arriving in the city to intelligently discuss this paper. I can assure you, however, that I thoroughly appreciate it, and the immense amount of work which the essayist has done.

I would briefly call your attention to one or two points that are of special interest to me, and to which I will refer again tomorrow in my talk to you. One is the action of ptyalin. The essayist remarked that ptyalin not only acts upon the carbohydrate food in the mouth, but that in all probability that action is continued after the foodstuffs have been mixed with the saliva and in the stomach, a point that I want you to remember for tomorrow, because I expect to show that the indiscriminate use of mouth-washes is wrong, especially if they contain astringent remedies, owing to the fact that the astringent constituent of the mouth-wash prevents for several hours the action of the ptyalin upon the carbohydrate constituents of the food.

I was also very much interested in the essayist's description of the process of splitting-up of the complex proteid molecule of the food in the stomach and intestines, because it is similar to the chemistry involved in the decomposition of the pulp; and some of you may perhaps remember some of the articles I have written on this subject, and which I shall again refer to tomorrow.

Dr. N. A. Stanley, New Bedford, Mass. The work which the essayist has presented to us is right in line, in a way, with what the President's address dealt with, and I am glad to know that we have a man in our ranks who is taking

his stand as a scientific investigator. We want more such men to put the profession where it belongs, where it will be recognized by members of the community and of the medical profession.

Dr. Doubleday in closing the discussion, showed a number of photomicrographs of saliva of different patients, comparing them with the crystalline elements of the known salts of the body, for the purpose of determining the crystalline elements in the saliva, a few of which are reproduced in the paper. [See pages 289–291 of this issue of the Cosmos.]

(To be continued.)

SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

Forty-first Annual Union Convention.

The forty-first annual union meeting of the Seventh and Eighth District Dental Societies of the State of New York was held in the Iroquois Hotel, Buffalo, N. Y., October 29 and 30, 1909.

The meeting was called to order at 11 o'clock Friday morning, October 29, by Dr. C. H. Sharp, Lockport, president of the Eighth District Society.

The President announced as the first item on the program of the forty-first convention a paper by Marshall Clinton, M.D., of Buffalo, N. Y., entitled "Tumors."

[This paper is printed at page 314 of the present issue of the Cosmos.]

Discussion.

Wm. C. Phelps, M.D., Buffalo. I have seen in my long practice of surgery many cases which would serve to emphasize the essayist's warning as to the danger of neglecting these growths in the mouth.

I would also commend his thought as to the affiliation or closer association of dentists and doctors in regard to these affections; in fact, I have never liked the stand that dentists have themselves taken, or maybe have felt themselves forced to take, in confining their work to the teeth. I think the dentist should go a good deal farther than that. Your name should be changed—you should call yourselves dental surgeons, and pay more attention to the growths which occur in the mouth. They are sometimes terrible. I have seen small growths beginning on the gums, others on the lower lip, and if treated early enough and removed thoroughly, which the dentist can do as well as anyone else, the growth of these tumors may be stopped. I have seen quite a number just inside the lip burrow and extend downward to the glands of the neck, and I have never yet seen a case of malignant disease in which the glands were involved where it was of the slightest use to do anything. Dentists see the cases before doctors do. These tumors should be removed, because removal is really the best; but if for any reason this is impracticable, they should be cauterized and not left to take care of themselves, as the infection very soon becomes uncontrollable. The only safe way of treating cases in which the periosteum has become involved in the growth is to remove a piece of the jaw. I have found that out to my sorrow, after not performing a radical enough operation. When the glands become enlarged, it is of no advantage to take out one of them; they should all be removed. If you leave the periosteum untouched, the infection is almost certain to recur. Go right to the periosteum, cut back of it

posteriorly and then forward on the anterior surface, and get rid of the infected area entirely. I have had two or three cases which rallied nicely under such treatment, and in which the disease did not extend. I have seen other small non-malignant tumors cause a good deal of trouble. I recently treated a case in the general hospital, of tumor on the lower jaw, which opened on the face. There was a running sore, and I did not consider the tumor malignant, which it was not, but I had to make an incision through the face in order to get down to it, and then I found in the bottom of the tumor two roots of teeth that had been broken off some years before. I had to dissect out all the diseased bone well below the alveolar process, cutting out the tumor, and in three weeks the case was well, whereas it had been running for years, and the patient had been treated by a number of dentists.

We should be prepared to treat these cases, and not be too timid to treat them in a radical way. You as dental surgeons should treat these cases, and not wait to send them two or three hundred miles to some hospital.

I have had a good deal to do with accidents which involved the mouth with resultant tumors, but these cases hardly come under the subject of this paper.

It cannot be emphasized enough that tumors or sores which start in the mouth must not be neglected. If you are not able to cure them by one or two applications of some medicament, apply more forcible treatment, but never allow them to run along until the glands of the neck are involved and there is no hope.

Dr. L. Meisburger, Buffalo. This paper should not be allowed to miss discussion owing to our timidity in discussing an M.D.'s paper. The essayist has given us some good advice in advising us to regard all growths of the mouth as malignant. If we do not feel competent to take care of these cases and are incapable of differentiating between a malignant and benign tumor, let us refer them to such men as have the ability and skill and knowledge of the subject.

I wish to take issue with one of the remarks of Dr. Phelps, who seems to have the impression that most dentists are men who only fill teeth. I feel a little too proud of our profession to allow a remark of that kind to go unchallenged. I believe that the average dentist of today goes as far as he dares in the surgical treatment of cases which come to his notice, and I trust that I may sometime have the opportunity of rectifying Dr. Phelps' views on this subject.

We are indebted to our chairman of the Business Committee for having taken the initiative in bringing before us so many medical men. The physician and the dentist are beginning, I believe, to appreciate the relative position which they occupy. Physicians begin to recognize that we are specializing along medical lines. I trust that in the future we shall frequently have the pleasure of having medical men with us.

Dr. R. E. Luther, Batavia. The paper and the discussion of this evening show once more in what respect the dentist and the physician stand on common ground. The relation existing between the dental profession and that specialist of the medical profession, the rhinologist, has been firmly established. Undoubtedly a very large percentage of patients suffering with adenoids are referred to the rhinologist by the dentist. If we do our duty, if we keep the teeth in proper position, in proper condition, and teach our patients their proper use, we as a profession are of great help to the medical profession in the way of preventive medicine. Such cases as Dr. Clinton has pointed out probably come to our notice earlier than to the surgeon's, and it is our duty to have our eyes open to observe these conditions and call the attention of our patients to them, and if we feel ourselves unable to treat these cases we owe it to our profession, to the medical profession, and to our patients, to refer them to the proper department of the healing art.

Dr. F. W. Low, Buffalo. I want to take issue with Dr. Phelps in one respect. We are not equipped in our offices to practice local surgery in the mouth. There are very few of us who can afford

to buy the needed equipment or who could perform these operations as well as specialists in oral surgery, like Dr. Clinton. I make it a rule, if I observe anything abnormal in any mouth, to advise such patients to consult immediately a specialist in oral surgery. I recently had a case of this kind in which I referred the patient to Dr. Parmeter, who was, however, out of the city. The patient therefore went to another surgeon, who told him to go home and make his will and come back the same afternoon and have the tumor removed. The patient reported this to me. I thought that I had diagnosed this case properly as epulis, but as I never operate without having consulted with a physician or surgeon, I told the patient that he would not die before a day or two, and could therefore consult Dr. Parmeter. He waited, and Dr. Parmeter told him that my diagnosis was correct, that I was as competent to operate as he was; that if the growth proved malignant, as the other surgeon thought it to be, he would be responsible for the operation. I operated, and the patient recovered. But I would never cut any tissue with the idea of destroying a malignant or benign growth in the mouth until I have at least the sanction of such a man as Dr. Clinton, because we are hardly competent to diagnose these conditions in their early stages. I confine my operations to the gums and the surrounding teeth. In any more serious cases, I believe the surgeon to be more competent to operate than the dentist.

Dr. F. A. Ballachey, Buffalo. As has been said, we frequently see in the mouth the beginnings of conditions which may prove serious, and yet I agree with Dr. Low that in the majority of cases we should consult with specialists before undertaking to operate. Our work is largely confined to the teeth and roots. On the other hand, very distressing conditions often arise apparently from the hard tissues of the mouth, and are first noticed by the physician. These conditions may be due to abscessed roots, and if the physician is not sure, I think it is well for him to consult a dentist before operating. The opening up of a tooth which contains a decomposed pulp may relieve the situation and save an operation through the outside tissues of the face. We all know of cases in which the physician has operated on a large swelling on the jaw through the face, when the trouble was found to be due to an abscessed root. Abscessed roots will cause untold agony and remarkable symptoms, and the dental profession is better able now than it was a few years ago to cope with them, even in their chronic condition.

I am glad to see on our program the names of so many medical men listed for both papers and discussions.

Dr. C. H. Sharp, Lockport. I do not remember having seen more than half a dozen cases of tumors in the mouth in all my practice; as it is so unusual for us to see such cases, we hesitate to treat them. Abscessed roots, of course, we see every day; we are treating them all the time, and we know what to do with them, but tumors in the mouth are so unusual that perhaps many of us never see them often enough to know what they are.

Dr. Clinton (closing the discussion). I have nothing further to add to the subject except to say that I have very much enjoyed the discussion, which shows an extremely wise spirit on the part of the men who have participated in it. I hope that our hearers have been impressed in regard to the nature of all of these tumors, which are potentially more dangerous than I have been led to believe dentists commonly regard them.

The next order of business was a paper by Dr. J. H. Beebee, Rochester, N. Y., entitled, "Pot-pourri," as follows:

Pot-pourri.

I should like to hear something of the progress of the Taggart matter. What has been done and what is being done, and what will be done? I myself can furnish evidence that the disappearing model is old. Some of you heard me tell at the Seventh District meeting of the process used by the Igorots in the Philippines; these men are savages, but

they have long used that process. They made a model of wax, and embedded it in fire-clay with a sprue leading through to the wax; around the end of this sprue they formed a cup-shaped depression to hold the metal. The clay was then dried and the whole heated, dissipating the wax, and then the heat was increased till the metal melted. This being accomplished, the clay mold was held under the tuyère of the blast, and the metal blown into the mold by a push of wind.

Some years ago I had to make an impression tray for a patient who had an abnormally large mouth. I made a model of wax incased in plaster and asbestos, and heated the whole till the wax was gone, when I poured in the tin.

I also spoke of a case for which I made a crown for a lower molar. The articulation was difficult, a large cusp on an upper tooth articulating into a depression in the tooth to be crowned. I made a band and soldered across the top a piece of No. 36 gage pure gold; this I placed on the tooth, and burnished it to fit the depression. I filled the depression thus made in the cap with wax, and placing it on the tooth asked the patient to close the jaws, thereby securing an impression of the antagonizing tooth. This was shaped and carved a little and the whole invested, leaving a sprue and a depression for the solder. The whole was heated, and, when the solder was fused the mass was tilted and the solder flowed in, assuming the shape of the wax which had been burned out by the heat.

It is nothing new for a brassfounder to make a wax model and invest it in core sand, and having baked it in a core oven to get rid of the wax, to make a casting.

I have notified the powers that be in this matter of the above evidence, but they seem to think that without me they have evidence that is sufficient. What I should really like to know is, Where are we at?

I believe that if Dr. Taggart has a valid claim to the disappearing model he should be upheld in his right, and I would, did I think his claim good, fight for him; but I do not believe that he has a better claim to the disappearing model than a man could have for boiling a tea-kettle on a Bunsen burner.

There are many details which I wish to mention in regard to inlay work. I find that in large cavities the most useful engine points are those made of carborundum. Up to a few months ago they were almost interdicted by lack of suitable ones. Those furnished by the dealers are either too large, except for cavities of immense size, or if small enough they possess no strength. A while ago Dr. Scrantom of Rochester suggested to me a form that meets most requirements when supplemented by a device of my own. These points consist of an engine bit on one end of which is a thin brass socket in which the small cylindrical carborundum points are held by shellac. These points are in almost all cases too large for use, and require reducing in size. This is easily done by means of the little grinder. The point is placed in the handpiece of the engine, and while revolving is held against the wheel of the grinder, whereby any size can be obtained in a moment. In forming small cavities I fail to see how any other steel bur than a fissure bur can be used. There are burs made like a fissure bur, only slightly tapering. These burs must be very satisfactory, though I have never had the pleasure of owning any.

In taking impressions for inlays I wish to again warn you against saliva, and especially blood, becoming incorporated in the wax. They will form an ash in the mold, and you are sure to get a porous casting. The cavity should be washed thoroughly with warm water the instant before the wax is introduced. I prefer, whenever practicable, a good-sized mass of softened wax, which is held between the thumb and finger or on one finger, forced into the cavity, and then worked down with the spatula or other instruments. One method that I have lately adopted in approximal cavities in most of the anterior teeth is to force the wax into the cavity and then take a piece of matrix steel as supplied by the dental depots and use it almost as one would a polishing strip, drawing

it around the tooth and wax, forcing the wax into the cavity and often shaping it entirely by the pressure thus exerted. This strip should be wiped on some oily surface to prevent it from dragging on the wax filling.

I have encountered some difficulty in securing a suitable wax, and after some experimenting I am now using a wax composed of equal parts of hard black wax and "tenax." I have also experimented with carnauba wax. This last is a product of the palm family, and is very hard. It has a high melting-point, and may be one of the ingredients of the waxes now on the market.

I have tried everything for sprues, but I find nothing so good as a No. 1 sewing-needle. The eye of the needle makes an excellent anchorage in the wax, and if the needle is too long it can easily be broken. I also find that it is an excellent practice to spear the under side of the investment with the point of the needle. This facilitates the escape of the air, and allows the gold to be forced more readily into the mold. Care should be taken that the needle does not reach to the model. Sometimes I have found a blow-hole in the casting. This is caused by the investment being too hot when the casting is made. This usually can be easily repaired by soldering with a high-grade solder, provided the borax is not daubed on the surface of the filling. Sharpen a match to a point and apply the borax with this in the blow-hole only. Then force in some foil or a piece of 24-k. gold as a leader, apply the solder, and heat.

One of the leading members of the fraternity was speaking to me of using gold and platinum alloy for castings, saying that they would be better than pure gold because harder. This is true to a certain degree. Gold and platinum make a very malleable and ductile alloy when mixed in almost any percentage. But do not deceive yourselves—it is impossible to make clasp metal of gold and platinum alone; there must be some copper. Platinum and gold, platinum and copper, gold and copper (except 19-k. gold copper alloy), all make soft metals. It is necessary to make an alloy of all these metals, if hardness is desired. This brings us to making alloys of precious metals and solders.

For crown work I use American coin gold, as it is much stiffer than the 22-k. gold furnished by the dealers. It contains at least nine per cent. of copper. The alloy of American gold coins is ten per cent. of copper and silver; the silver, however, must not exceed ten per cent. of the copper, or one per cent. of the coin.

I make my own solders, and will describe the mode of procedure. In making alloys of metals, except in case of gold and platinum, always melt the most refractory metals first, and then add the others in order of their melting-point, those with the highest first.

Composition for making silver solder. Pure copper 2 parts, pure zinc 1 part.

Silver solder. Composition as above, 1 part; pure (not coin) silver, 2 parts.

Gold solder. From *gold coin*—20-k.: Divide weight of gold by 12.5; add silver solder (see above) the weight of quotient thus obtained. 18-k.: Divide by 5. 16-k.: Divide by 2.86. 14-k.: Divide by 1.84. From *22-k. gold*—20-k.: Divide by 10. 18-k.: Divide by 4.5. 16-k.: Divide by 2.66. 14-k.: Divide by 1.75. From *24-k. gold*—20-k.: Divide by 5. 18-k.: Divide by 3. 16-k.: Divide by 2. 14-k.: Divide by 1.4.

In all cases melt the gold first and do not overheat it after adding the alloy. If the melting is done with a blowpipe on charcoal, flatten the globule when melted with a piece of iron or steel, then turn the ingot over, re-melt it carefully, and flatten it again. Repeat this several times. This is done to obtain a thorough mixture of the metals. Gold, being of so much greater specific gravity, will sink to the bottom. The better way is to roll out the mass very thin after the first melting and then to re-melt it. In this case one re-melting is sufficient. Use plenty of borax.

The reason for making a composition instead of mixing the metals at once is that the zinc is so volatile that in using small quantities it is apt to burn out, and the resulting alloy will not be true

to the formula. Never heat beyond the melting-point of every metal in the mass.

I wish also to bring up the subject of local anesthesia as applied in the extraction of teeth, which Dr. Thomas in an article on "Extraction of Teeth: Local Anesthesia," published in the DENTAL COSMOS for June 1909, page 665, decries. He says in that article: "The ill effects of cocain injection have to some extent been called to the attention of all dentists, but the number of cases coming under the notice of anyone making a specialty of extraction is appalling." He says that nothing has ever been introduced into our practice that can be compared with cocain in creating suffering and working havoc on an innocent public.

Dr. Truman says that if the amount injected is small, in all probability it will do nothing more than deprive the parts of all sensation, but in doing this it may have, as a resultant, hyperemic conditions productive of more or less severe pain, lasting for days after the teeth have been extracted. If, on the other hand, the dose injected has been large, the death of the parts involved is almost sure to follow, and extensive areas of necrotic tissues will surely be the result. Dr. Truman believes that if cocain is injected even in small percentages, this procedure is very uncertain and liable to cause gangrene and gingival necrosis of the alveolus. He says in conclusion: (1) Cocain immediately paralyzes all nerves and acts directly on the local circulation. (2) The paralyzation of the nerves and the vaso-constriction results in temporary and possibly permanent cessation of nutrition to the local parts. (3) This paralyzation may end in gangrene (sloughing) of the gingivæ and necrosis of the adjacent alveolus, and finally (4) the possible pathological sequelæ connected with its use render it unfit for adoption as an analgesic in dental operations.

Dr. J. V. Shoemaker of the Medico-Chirurgical College says that the application of cocain is dangerous whether used in dental or any other operations.

I myself am suffering from a condition induced by the extraction of an upper molar, the surrounding gums of which were injected. This was a year and a half ago. A patient of mine who would not come to me in order to have a large number of teeth removed, because I would not inject his gums, went to an office where this was done, and as a result was in bed for fifteen months, part of that time being attended by two trained nurses. Still another patient had been in the hospital as the result of conditions produced by cocain injected for the purpose of extracting teeth.

I am aware that it is a great relief to get rid of the pain induced by extraction, but are we as a profession wise, to say nothing of righteous, in countenancing the indiscriminate use of cocain. Dr. Thomas cites case after case in which sloughing not only of the soft parts but of the bone itself occurred. I should like to know the mind of those present on this matter. Personally, I make it a point of doing no extracting if I can avoid it, and I have never injected cocain.

Discussion.

Dr. C. K. BUELL, Buffalo. I do not think it necessary for us, as a society, to concern ourselves with the Taggart matter at this time. The matter is now in the hands of the courts, and when the courts decide the matter it will be time for us to act.

With reference to stones for cavity formation in gold inlays, as mentioned in the paper, I believe that a set of about thirty stones is put out by Lee S. Smith & Son for this purpose; to one who makes cast gold inlays these stones are of great value in the forming of cavities.

For finishing the margins I use the porcelain inlay burs manufactured by Klewe & Co. They are small and very similar to the plug-finishing burs, except that they are of a long cylindric shape, a very convenient form.

As to forming the wax in the cavity, I gave a little clinic at the state society last May, in which I illustrated my method of forming the wax, which I shall again demonstrate tomorrow. I am not familiar with the two kinds of wax

mentioned by Dr. Beebee. I have used the Taggart wax and am still using it, as apparently no other wax can compare with it. Peck's wax in my experience comes next to it. I have used the Taggart sprue exclusively, which is somewhat larger than that mentioned by the essayist, and have no fault to find with it.

With reference to pure gold and gold alloyed with platinum, I made a few experiments with the following results:

	At 100 lb.	At 300 lb.
Pure gold yields.....	3 points	21 points
5% platinous gold yields..	1 point	12 "

There is no doubt that a cast gold inlay will give way under the continued force of mastication and "flow" sooner than will a malleted gold filling, but the addition of a small amount of platinum to the gold will remove this tendency.

I have never attempted to make solders; I find that the solders as sold by the manufacturers answer all purposes, and were I to attempt to make solders myself I might make an inferior product.

I have not made any extractions in my own office for the last four years. I do not like the work and prefer to send such cases to a specialist.

Dr. L. S. Goble, Rochester. If Dr. Beebee had done nothing else than suggest the idea of using the No. 1 needle for the sprue, it would have been well worth our while to make the trip to this meeting. As he has so well stated, the high polish of the needle and the opening of the eye make it a very useful instrument, which will solve quite a little problem in my practice.

The essayist speaks of filling the blow-holes in inlays with the blowpipe and solder. I would prefer filling them with gold foil. The essayist may be more expert than I am with the blowpipe, and may probably fill them better and more quickly by his method, but I have had better success in filling the blow-holes with gold foil.

I am sorry that Dr. Buell did not say more about his method of using the wax. I have tried Dr. Beebee's method and have had a good deal of trouble in suitably forming the wax for the gold inlay.

Dr. B. C. Nash, New York. As to the Taggart process of inlay making, I was present at the meeting of the New York Odontological Society some two years ago when the matter was first brought before the profession. It was received with great enthusiasm, and not one word or suggestion was made as to its being an old process, and I feel confident that but for Dr. Taggart gold inlay making would not have advanced beyond the burnishing in of the gold matrix and filling that with solder. Our revered friend, Dr. Littig, at the close of the meeting, in a touching tribute voiced his appreciation of what Dr. Taggart had given to the profession.

Dr. Ross Porter, Oil City, Pa. The essayist spoke of blow-holes and of the difficulty in finding the cause. I used to have great trouble in this respect, and did not always know the cause. For filling these blow-holes I use crystal gold. The solder will flow over that more easily than over the gold foil that Dr. Goble mentioned, and the only precaution necessary is to paint with whiting the part of the inlay that you do not wish to be touched by the solder, and it will not flow over that portion.

As to wax, we will hardly find two men who use it in the same way. I started to experiment with different sorts of wax soon after Dr. Taggart presented his method, and at that time I found no wax suitable. The best was a base-plate wax made by the J. Bird Moyer Co. I then began to study waxes, and the result was a wax somewhat similar in action to resin, not so sticky and of a better quality; a small quantity of it will give you a larger range between what we might call the melting-point and the chipping-point of the wax; in other words, wax that when cooled will be hard, and which requires little heat to be changed to a very soft plastic condition. I will explain my method of using this wax tomorrow in my clinic.

Dr. S. R. Meaker, Auburn. I am in position to use a great deal of local anesthetics, sometimes two ounces a day, in one of the state institutions. I use a one per cent. solution of cocain combined

with adrenalin chlorid. I do get sloughing once in a while. I do not use a great deal for an injection, seldom more than eight or ten drops, and sometimes that will last sufficiently long for the extraction of two or three teeth. Often a great deal of pain results. Men come back to me occasionally with fearful pain, and I may say that in perhaps a dozen cases of extraction one or two exhibited after-pain. The question with me is how to avoid this. I have to use a local anesthetic, as the institution does not provide for the administration of a general anesthetic. I would like to hear from someone who has had experience, how to avoid these instances of after-pain.

Dr. D. H. Young, Attica. This is a subject that interests a great many dentists, because something of the nature of a local anesthetic has to be used so often by the dental practitioner that it becomes imperative to know all we can about its composition and the best way to use it.

In the journals some writers entirely condemn the use of a local anesthetic; that, however, seems wrong when we consider how often it is applied as compared with general anesthetics, and yet how few the fatalities from cocain are as compared with those due to chloroform or ether. Surgeons realize the advantages in the use of cocain, and some, as you are all aware, are even performing abdominal operations with its use, preferring it to general anesthetics.

I believe that if the dentists would select some of the best standard solutions instead of each dentist selecting his own, and would use better judgment and more thorough antiseptic precautions in administering it, we would hear less about bad results, which would tend to create a higher appreciation of its real value in alleviating pain.

Dr. A. E. Mimmack, Buffalo. I have used cocain and have experienced sloughing. I have also seen cases in which no anesthetic was used and the tissues were not sterilized, in which sloughing and gangrene followed, and I have seen sloughing occur under the same conditions after a general anesthetic had been used. In both cases the sloughing was due to a lack of sterilization. There is on the market a preparation of novocain and adrenalin. I have been using this in a one per cent. solution, and I obtain the same results as from the use of cocain. This is a synthetic preparation that you know has no impurities in it, because of the reliability of its manufacturers. In the use of cocain for making our solutions a risk of impurity is involved.

I occasionally use this novocain and adrenalin with the normal salt solution, and could hardly do without it.

Referring to Dr. Beebee's remarks about wax, Ransom & Randolph put up a wax that I have been using ever since they put it on the market. It is very soft, but when chilled it is as hard as any wax I have found. It is very easy to manipulate, and very satisfactory.

Dr. L. Meisburger, Buffalo. Any local anesthetic may produce an untoward result; it is not confined to cocain. The strength of the solution or unclean instruments are not always the cause of sloughing, which is often due to the force used in injecting the medicament into the tissues. These are very vascular, and are easily broken down by the pressure. Even if the instruments are sterile and a sterilized aqueous solution is used, the same bad results may be produced by exerting great pressure. But even then it is not very difficult to take care of such cases of sloughing; one or two treatments usually suffice. I always require such patients to come back within a day or two, as sometimes a condition ensues that needs attention. A little dead tissue may have to be removed, and therefore I believe in requesting the patients to return in order to have any untoward conditions that may arise attended to.

The meeting was then declared adjourned until the afternoon session.

(To be continued.)

THE DENTAL COSMOS

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Devoted to the Interests of the Profession.

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EDWARD C. KIRK, D.D.S., Sc.D.

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PHILADELPHIA, MARCH 1910.

EDITORIAL DEPARTMENT.

THE INTERNATIONAL MEMORIAL TO WILLOUGHBY D. MILLER.

W. D. MILLER died July 26, 1907. The news of this fact brought forth expressions of sorrow from every country of the civilized world where dentistry has a professional standing, and the consensus of opinion was that the profession of dentistry had never before sustained a loss of such magnitude nor one so far-reaching in its effects as that occasioned by the death of our recognized leader in dental science. Now, nearly three years after the event, the conviction grows that the estimate placed upon the services of Miller to dentistry and through dentistry to humanity at large was by no means an exaggerated one. Indeed, we are learning to appreciate more fully the extent of his service and to feel more keenly the setback to scientific progress in dentistry which the interruption of that service by the death of Miller has entailed—not only because of our appreciation of his work but because of our appreciation of his personality as well, and still further

because of the influence which he exerted in unifying the activities of dentistry upon higher social and scientific planes. Everyone who knows anything about dentistry and who consequently knows anything about Miller's service to dentistry, acknowledges either openly or to himself the debt of gratitude which each of us as individuals, and all of us as a profession, owe to the activities compressed into that one short life.

Soon after Miller's death certain of his colleagues in Europe, through the instrumentality of the International Dental Federation, endeavored to establish a fitting memorial in his honor and to raise a fund for that purpose. In the beginning of this endeavor the movement was characterized almost wholly by the sense of gratitude which all felt for the service of Miller to dentistry, though the form which the memorial ought to take had not been definitely thought out. Within six months after the death of Miller the sum of over three thousand marks had been collected in Germany alone toward the Miller Memorial Fund, and through the activities of the International Dental Federation Committee appointed for that purpose, of which Dr. Carl Röse was chairman, steps were taken for the collection of additional contributions from other countries and in Germany as well. Up to the present time the grand total of money collected from all countries for the Miller Memorial Fund is perhaps a little over ten thousand dollars, of which amount the United States up to the present time is credited with nearly two thousand dollars.

It will thus be seen that the amount of money subscribed in Europe as a memorial in honor of an American citizen, the foremost man in the dental profession, is greatly in excess of the amount which up to date has been subscribed by his own countrymen. We believe that the mere mention of these figures will appeal to the national and professional pride of the dentists of America in a way which will lead them to promptly wipe out this deficiency, which so long as it lasts is discreditable to our professionalism as well as to our Americanism.

Were Dr. Miller living, and if it were proposed today to honor him with an international banquet with covers laid at ten dollars per guest, there cannot be the slightest doubt that no less than one thousand American guests would be ready and anxious to sit at a banquet in honor of Dr. Miller. And if that fact be

granted, just why the same number of subscribers at the same figures cannot be found ready and willing to honor Dr. Miller without eating a banquet as a part of the ceremony is difficult to understand. An appeal by the American Committee, of which Dr. Truman W. Brophy is chairman, has been sent to the officers of each of the dental societies of the United States, with the result that the appeal both by circular and personally has brought forth a total response of less than two thousand dollars. On behalf of the American Committee we again call attention to this matter, and desire to emphasize in every way possible our belief that it is not only an opportunity but a duty on the part of the dental profession in America to see to it that the total amount contributed to the Miller Memorial Fund from American sources shall be not less than the amount contributed by the dental profession of any other nation. Indeed, all things considered, the American contribution should lead the rest in size and in the promptness of its remittance.

The Central Committee of the Fédération Dentaire Internationale, composed of representatives of each country, has decided to make use of the interest on the general fund to present to the member of the dental profession each year who, in the judgment of the International Committee, makes the best contribution to the science or art of dentistry, or in literature or in original research work, a gold medal, a diploma, or a sum of money. It is possible that the committee may take into consideration all of the objects named.

In various ways and in many directions the effort has been made within the dental profession to stimulate an interest in scientific research, in the development of our literature, in the improvement of our art. These objects represent the life-work of Dr. Miller. Appreciating that fact, the committee in charge of the Memorial Fund has adopted a plan which sympathetically perpetuates the spirit of Miller in its relationships to the dental profession by establishing a prize which will be perpetually regarded as the highest honor to be won in dentistry and which will always be the mark of approval which the profession can place upon any man in any of its departments of activity. The basis of the proposed work is sufficiently large to make it accessible to the man who does the best character of work in any of

the departments of dentistry. It is not proposed to confine the award to those who do strictly scientific work, but the honor is open to those who shall make the most valued contributions to the progress of dentistry in any of its phases. Therefore, quite apart from the question of the honor to the memory of Dr. Miller, each contributor to this fund helps in honoring his profession by aiding in the establishment of a reward for those who do the best work in dentistry, thus furnishing a stimulus which in the course of time cannot fail to improve the abilities and the standards of attainment throughout the whole dental profession.

Contributions may be sent direct to Dr. Truman W. Brophy, 6 Madison st., Chicago, who is chairman of the Committee of the National Dental Association of the United States, or to Dr. William Carr, 35 West 46th st., New York, or to Dr. B. Holly Smith, 1007 Madison ave., Baltimore, Md., members, or to Dr. Rudolph Beck, 92 State st., Chicago, secretary, of the American Committee.

A considerable portion of the American fund already contributed has been furnished by dental societies, while the subscriptions from individuals have been comparatively few. Let it be remembered that the man who feels that he has done his part because he belongs to a society which has already contributed to the Miller Memorial Fund has failed of his duty as an individual. The bulk of the total American contribution, if it is to be in any sense an expression of the estimate in which American dentistry holds the memory of Miller, should be made up of individual personal subscriptions.

The meeting of the International Dental Federation, at which the report of the American Committee will be submitted, is to be held in Paris during the last week in March, and subscriptions should be sent in promptly in order that the American showing at the next meeting of the Federation may not be discreditable to us.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Deutsche Zahnaerztliche Wochenschrift*, Munich, November 6, 1909.]

PLASTER AND PLASTER IMPRESSIONS.

By Dr. Herrenknecht, Freiburg.

The success of any artificial denture depends upon a good impression. Plaster has by long experience been found to be the most reliable of all impression materials. Unfortunately it is not an entirely stable product, since, although it be manufactured according to a standing formula, it varies in absorption of water and duration of hardening. Its qualities are also influenced by the water which it may absorb from the air, for which reason it is to be preserved in a dry place and with exclusion of air as far as possible. Plaster which has been spoiled by the absorption of water may be rendered useful again by heating to not above from 100° to 130° C. Another disadvantage is the change of volume which plaster undergoes during and after hardening. Exact investigations, as carried out by I. H. van't Hof, E. T. Armstrong, W. Hinrichsen, F. Weichert, and G. Just, have brought to light the fact that plaster contracts in such a manner that sometimes a small temporary expansion with subsequently stronger contraction takes place, which is in contradiction to the statements contained in most text-books that plaster expands. (*Cf.* also Stewart J. Spence, "The Behavior of Plaster of Paris," Dental Cosmos, July 1903.) This change in volume may be somewhat reduced by very fine grinding and good mixing. The "warping" of the plaster is probably due to the absorption or elimination of water in already hardened plaster. The author has conducted a series of experiments with the purpose of discovering a means to prevent or at least restrict the change of volume in the plaster. To this end he adds to the plaster before mixing one to two per cent. of red iron oxid, which incidentally facilitates the separation of the model from the impression, and reduces the time of setting by about one-half. This time of setting can be further reduced by the addition of one per cent. sodium chlorid to the bulk of the mix. Plaster mixed with water at 20° C., one per cent. red iron oxid, and one per cent. of sodium chlorid will harden in about four minutes, the process of hardening being completed very rapidly after the plaster has begun to set. The addition of iron oxid renders the structure of the plaster much firmer, and if the impression has to be removed in sections, produces very sharp and clean fractures; it also seems to reduce the changes in volume of the plaster, although the experiments in this direction have not yet been completed. The addition of molding sand, marble dust, graphite, etc., retards the process of hardening and impairs the sharpness of the fractures, and is therefore not to be recommended. If the impression must be removed in sections, the impression tray is to be removed when the plaster sample breaks with a sharp fracture, yet is still sufficiently soft to allow of its being reduced to a smeary mass under moderate finger pressure. In no case should the operator wait until the increasing warmth of the tray indicates the hardening of the plaster. For assembling the sections on the tray the author recommends a concentrated solution of celluloid in acetone. The joints become very firm in a short time, no disturbing layer of celluloid solution intervening. This solution may also be employed for fastening broken plaster teeth to the model, or for reassembling a model that has been broken in packing the rubber. In making this solution celluloid scraps may be used.

[*Les Annales Dentaires*, Paris, October 1909.]

ONE CASE OF FUSED TEETH AND ONE OF GEMINATION.

By Dr. M. A.-E. Zeckendorf, Liège.

The first case, in which the anomaly of fusion of two teeth was observed, is described as follows: A boy wished to have the deciduous upper left lateral extracted.

A deep ulceration of the gingiva and the interior portion of the lip was observed, the tooth being denuded of gingival tissue down to the root. All the other deciduous teeth were present. The left central and lateral were carious at the approximal surfaces down to the cervical portion. An incision of the gingiva was made to facilitate the extraction, but to the operator's great surprise the left central came away together with the lateral. It was then seen that the roots of the two teeth were fused, showing only a slight groove. The crowns were separated by the caries, and it could not be ascertained whether the crowns had been fused together like the roots before they had been attacked by caries; indications were that this had not been so.

In the second case, a woman presented gemination of the upper right lateral. All incisors and canines were present. The upper right lateral was ten and one-half millimeters wide, and on the labial surface showed a groove running down its entire length. At the lingual portion a triangular tubercle was observed with its base toward the root. This anomaly then seems to represent a fusion between the upper right lateral and a supernumerary tooth. The tubercle on the lingual surface probably indicates the formation of a second supernumerary tooth, and the roots of these teeth are probably fused together. As the patient would not allow an X-ray picture to be taken, this supposition could not be confirmed. The author goes on to critically review the various explanations that have been given for these dental anomalies.

[*Zeitschrift für Zahntechnik*, Vienna, November 25, 1909.]

MAGNALIUM IN DENTAL TECHNICS. By Max Ordover, Lemberg.

In trying to find a material for plate work which would combine the advantages of gold with cheapness, other metals have been suggested, especially aluminum, which, however, even though it be chemically pure, becomes decomposed after some time in almost every mouth. Magnalium, an alloy of aluminum and magnesium, invented by the chemist Mach, is much more durable. About six years ago an attempt was made to introduce magnalium in dentistry. The mistake was, however, made of furnishing the magnalium in too hard and brittle a condition; moreover, the methods of fastening rubber to it were unsatisfactory. Like rubber, when it was first introduced, magnalium was opposed by many eminent practitioners, such as Mueller of Zurich. After six years of experimenting, the author has found, however, that swaged and cast magnalium plates as well as magnalium fillings successfully resist the action of the secretions of the mouth, the plates being thin and firm, non-brittle, lighter than even gold plates, and cheap, the edge strength of the fillings being remarkable. These observations have been confirmed by an article of Dr. Loebl, published in *Zeitschrift für Zahntechnik*.* Magnalium must be treated somewhat differently from gold in swaging and casting. After the impression is taken, the rugæ are deepened with a spoon-shaped instrument, as the elevations on the model are otherwise slightly compressed. The plates are first swaged on a model of an easily fusible metal and finally on a model of Spence metal. Soldering should be avoided. The best method of fixation is that with rubber and conical holes. The thickness of the plate is 0.8 mm., the polishing reducing this thickness to about 0.6 mm. For casting magnalium plates, the plates are shaped up with several thin layers of wax and carved. Instead of conical holes, round pieces of wax are stuck on the wax plate; these small round wax pieces are obtained by pressing wax through a small tube. Magnalium can be cast directly to porcelain teeth, which must, however, be furnished with thin backings of gold or platinum. After heating, the mold is allowed to cool for at least fifteen minutes before the magnalium is cast.

[*Odontologisk Tidskrift*, No. 4, Goeteborg, 1909.]

CONTRIBUTION TO THE SIMPLIFICATION AND UNIFORM METHOD OF THE PROSTHETIC TREATMENT OF RESECTION AND EXARTICULATION OF THE MANDIBLE. By J. Billing, Stockholm.

After reviewing the merits of the methods suggested for the prosthetic treatment of resection and exarticulation of the mandible as represented by the German and French schools, Schroeder, Partsch, Hahl, Heller, and

* *Cf.* also Dental Cosmos, September 1908, page 1036.

Koenig on one side, Martin and Lemerle on the other, the author describes the following simplified technique as evolved by him: A silver plate of the same length as the case to be treated but of double breadth is bent doubly, shaped to correspond to the portion of the mandible to be removed, cut open at both ends, and these ends are bent and shaped so as to clasp around the respective stumps of the bone anteriorly and posteriorly. During the operation this simple prosthetic provisional apparatus is secured by sutures. Of instruments only a suitable pair of shears and one or two tweezers for bending are necessary. The thickness of the plate used—which is most easily borne by the tissues—is 0.6 mm.

This method offers the following advantages: (1) The stumps of bone being clasped both anteriorly and posteriorly are firmly held in position. (2) The apparatus is sterilized by boiling. There are no sharp edges, and no soldering is necessary. (3) The soft tissues are supported satisfactorily and the apparatus may be given any desirable form by bending. (4) In fixing the apparatus by suturing it is recommendable to have the suture end on the buccal side, where it may serve for drainage. The cosmetic result is also most satisfactory.

[*British Dental Journal*, London, November 15, 1909.]

THE ANTISEPTIC VALUE OF FILLINGS AND DRESSINGS. By Professor H. P. Pickerill.

With a view to establishing some precise data as to the action of the substances commonly used in dental surgery for the purpose of filling and dressing teeth, the author has undertaken a series of experiments since 1906, unaware of those conducted by Miller on similar lines. The present tests, however, go farther than those of Miller, and moreover were conducted under conditions more resembling those found in the mouth.

The conclusions reached are the following:

That few filling materials have definite antiseptic properties, the most powerful being copper amalgam, the others tested being, in order of potency, zinc oxyphosphate, Ascher's cement, Fellowship amalgam, and copper oxyphosphate (very feeble). That other filling materials—*i.e.* some amalgams—may be the vehicle for carrying infection to an otherwise sterile cavity, but that such infection may be prevented by simple precautions. That gold has no antiseptic properties. The fact that gold makes a good and durable filling is to be accounted for by the aseptic precautions wittingly taken in inserting it. Speaking generally, filling a tooth with copper amalgam may be taken as an instance of "antiseptic" surgery, while filling it with gold is an example of "aseptic" surgery. That of the ingredients of compound materials, such as amalgams, the only ones which show any antiseptic action are copper and zinc. Mercury has bactericidal properties at body temperature, but not at room temperature, and alloying the mercury with other metals does, in some cases, destroy its antiseptic powers. That as regards drugs used for dressings, mercury perchlorid proved to be the most powerful and most penetrating to dentin. That pure carbolic acid is an efficient sterilizer of dentin, at least up to 1.5 mm. in thickness. That formic aldehyd in either form penetrates dentin well, but that its effect is lost as soon as the gas has escaped. This is of special significance in relation to mummifying pastes. That formic aldehyd solution of paraform sealed in is a most efficient sterilizer of septic root-canals, penetrating from the pulp-chamber to the apices of the canals, but that carbolic acid used in the same way has practically no value.

If these conclusions are of any value, then the following precautions should be observed in filling teeth: Always sterilize the cavity after mechanical preparation. If the material to be used for filling either cavities or root-canals be not in itself decidedly antiseptic, it should be sterilized before insertion.

[*Revue Générale de l'Art Dentaire*, Paris, November 1909.]

IODIN AND CALCIUM HYPOCHLORITE IN ABNORMAL DISCOLORATION OF THE TEETH. By Dr. R. Kern.

The deep discoloration of teeth due to penetrating caries or to some vital trouble varies considerably, from a dark reddish to a blue and grayish black shade, according to the mouth, temperament, and age of the patient. The main cause is the death of the pulp, with or without caries. The rupture of the bloodvessels is followed by an invasion of the coloring matter of the blood into the canal-

iculi of Tomes. The hemoglobin in contact with oxygen, for which it has a great affinity, is transformed in time into hematin, hemin, or hematoidin, and produces oxyhematin—

$$(C_{68}H_{70}N_8Fe_2O_{10})$$

which is fixed, forming a hypothetical compound with the lime of the dentin. The iron contained in this compound, which the author calls "hematin-calcium," produces the abnormal coloration. It is also to be noted that hydrogen and arsenic form with the hematin of the blood an absolutely fixed combination. Frequently after the application of an arsenous dressing a reddish brown coloration of the tooth is noticeable, due to a combination of the arsenated hydrogen with the hemoglobin of the blood in the pulp-vessels. In passing, it is worthy of notice that in all these stable combinations the vacuum plays a great part in withdrawing all the gases from the combination, and may furnish an expedient for bleaching.

In time, other secondary causes impart an abnormal color to a dead tooth. Each bacillus produces its particular color—the micrococcus luteus a lemon yellow, the bacillus luteus a golden yellow, the bacillus pyocyaneus blue of all shades, the micrococcus prodigiosus a red or rose, the bacillus bonneus a brown or maroon, the bacillus fluorescens liquefaciens a green. Different food substances, especially the vegetables, contain coloring materials which are set free by the action of the saliva and the fermentations in a carious cavity.

Iodin crystals, applied as a root-dressing under cement and renewed several times, first impart to the tooth a very pronounced blackish color, which gradually disappears, leaving the tooth in a very satisfactory, very natural shade. The different phases produced by the iodin are due to its reactions on the compound hematin-calcium, by producing calcium iodid and setting free the hematin and the oxygen. The inconveniences connected with the iodin treatment have led to experiments with calcium hypochlorite, which is at the same time disinfectant and antiseptic. The discolored tooth is painted repeatedly with calcium hypochlorite, and a dressing is left in the cavity if there be any, for twenty-four hours, which has an antiseptic action on the caries. The hypochlorite acting on the hydrogen liberates nascent oxygen, which decomposes the coloring substances by its union with the carbon in these substances. This latter method is more rapid, as a result can be obtained in one sitting. Care must, however, be taken not to damage the tooth by too frequent applications. Another advantage is the great power of penetration of the hypochlorite, which enables it to readily reach the coloring matter on which it is to act.

[*Zahnaerztliche Rundschau*, Berlin, November 7, 1909.]

THE CLOSING OF THE PERFORATED APEX OF THE ROOT, WITH SUBSEQUENT FILLING OF THE ROOT-CANAL BY A NEW METHOD. By Dr. Leo Scheller, Warsaw.

Perforation of the apical foramen is due either to resorption from chronic suppuration of the maxillary bone or to intentional or accidental mechanical widening of the root-canal. By this widening of the apical foramen sufficient space is generally secured for the draining of the pus and for the insertion of disinfectants or astringents producing healthy granulation. The failures in such operations are generally attributable to the pressure exerted by the material obturating the apical foramen and by the subsequent filling of the root-canal upon the tender wounds of granulation. The filling of the root-canal with permanently soft or gradually softening disinfectant pastes sealed in with cement or gutta-percha, salutary though it be for a time, is contra-indicated, as it becomes included, as it were, in the circulatory system by and by, and being in direct contact with living and physiologically active tissue is finally dissolved and resorbed —consequently a hollow area is left in the root-canal, which offers a field for the deposition of obnoxious material from the blood and sets up a new infection. The author therefore advocates a solid metallic closing of the perforated apical foramen, the method of which he describes as follows: In cases in which the apical foramen has been resorbed so far that no narrowing of the root-canal is perceivable, and there is great danger of forcing foreign bodies into the alveolus, the length of the canal to be closed up is first ascertained. If the apical foramen is already widened, careful sounding with a ster-

ilized pulp-canal cleanser is advised, around which cotton has been wrapped at some distance from the end.

If the apical foramen has to be widened first, the length of the canal can be ascertained by wrapping some cotton around the lower end of the bur. That portion of the bur that is denuded of cotton after burring indicates the length of the canal, provided, of course, that the bur has not been carelessly thrust into the socket. For closing up the foramen silver is used, as it has no irritating influence upon living tissue and is even bactericidal. The end of a pure silver wire of 0.2 mm. thickness is melted over an alcohol flame into a small ball of a diameter of about 1 mm. The wire is inserted into the corresponding hole of a fine draw-plate, and the ball driven through with mallet blows. The selection of the hole depends upon the thickness of the bur used in perforating the foramen, that hole being selected through which the bur can be drawn only with friction. In this way a silver wire with a cylindric plug at its end is obtained whose diameter is somewhat smaller than that of the foramen, but is sufficient to prevent any plastic material from being forced past it. The wire is marked to show the length of the root canal and bent at the mark at a right angle. The silver plug, when introduced into the desiccated and cauterized root-canal, is prevented from gliding beyond the apical foramen by the bent-over end of the wire. The root-canal is then firmly packed with gutta-percha, the protruding end of the wire being held by the left hand, or being fixed to an approximating tooth by Stent's compound. The root-canal is then cauterized with a fine galvano-cautery. Into the heated and sterilized root-canal a small stick of Gilbert's temporary stopping of 0.5 mm. thickness is introduced, and packed in with a pointed sound. This cauterizing of the root-canal after the introduction of the silver plug serves a double purpose, first to sterilize the entire length of the root-canal; second, to conduct the heat through the silver wire and plug beyond the apical foramen, and to sterilize the portion lying beyond the plug. The protruding wire-end is cut down to a few millimeters, rolled up with a pair of fine pincers and pressed into the slightly heated gutta-percha. If after the operation phenomena of irritation are noticed, the wire-end can be easily unrolled, held with fine pincers, and the gutta-percha partly removed with a bur, the rest softened with the cautery, and the entire filling removed. As silver wire is a good conductor, the gutta-percha is softened all through, and the stopping can be removed without any pressure. The entire stopping should not be removed at once, since a vacuum may be created that would cause bleeding of the new granulation tissue. For sterilizing the root-canal the author employs the galvano-cautery. (See Periscope, February Cosmos, page 251.)

PERISCOPE.

Silver Wire After Resection of Portion of Mandible.—In the case reported, two inches of the mandible of a boy of nine years had been removed for sarcoma. The bone was divided in front at the level of the left canine, and behind just above the junction of the body with the left ramus. The periosteum covering the lower border of the excised segment was carefully preserved. The resected surfaces of the mandible were pierced with a bur to the depth of three-fourths of an inch. The drill-hole in the body was horizontal, and placed near its lower margin so as to miss the tooth-roots; that in the ramus was vertical and somewhat posterior to the mandibular foramen. The ends of a stout silver wire of suitable length were pressed tightly into the drill-holes, and the wire was completely covered by suturing together the mucous membranes of the cheek and the floor of the mouth over it. The boy can open his mouth almost fully, and when the jaws are closed, the teeth on the right side articulate correctly. The patient is able to take soft food, and has to be restrained from attempting greater masticatory feats.—S. White, *British Med. Journ.* per *Journ. Amer. Med. Association.*

To Remove Steele's or Brewster's Facings from a Bridge Out of the Mouth.—Invest the bridge, covering the teeth, and heat it slowly over a Bunsen burner or gasoline stove for an hour; let it cool and the teeth will come off by using a little force.—R. E. Cockrell, *Dental Summary.*

Chronic Suppuration of the Maxillary Antrum.—J. Donelan considers the important thing in chronic antral suppuration to be to operate as early as possible by a sufficient removal of the middle or posterior part of the external nasal wall, and not to allow such cases to drift on to formation of nasal polypi and polypoid degeneration of the antral mucous membrane, which may need the much more severe and sometimes disfiguring radical operation.—*Lancet.*

Gold Solder.—In soldering and reinforcing gold crowns, the solder used should be of very little lower karat than the gold used in the crowns themselves. Solder of a lower karat attacks the crowns, eating into them as it were, thus sometimes causing small holes. In reinforcing gold crowns too much solder should never be used at one time, for an excessive quantity of solder necessitates excessive heating of the crowns, which considerably impairs their solidity.—*Geo. Poulson's Bericht.*

Empyema of the Antrum of Highmore.—The first etiological factor to be considered in empyema of the antrum of Highmore is the teeth. There are a considerable number of persons in whom the teeth, especially the first and second molars, protrude into the antrum. The osseous part of the cavity is sometimes so thin that it breaks easily when a tooth is extracted, thus opening the maxillary sinus. That an acute empyema may develop in such a way is well known. It is only surprising that infection does not more frequently occur in this manner. Much more frequently, however, dental caries perforates the bone and penetrates the cavity of the antrum. The majority of cases of empyema of the antrum have their origin in the nose. Given a case of empyema of long duration, frequently the reverse happens, namely, that as the result of the long stagnation of the exudate in the antrum, the teeth which protrude sometimes into it become affected, and their integrity is endangered. Therefore it may be correct to say that in some cases of empyema of the antrum the aid of the rhinologist is required; in others, that of the dentist.—W. Freudenthal, *Med. Record* per *New York Med. Journal.*

Care of the Mouth in Diabetes Mellitus.—Levison points out that in the treatment of diabetes mellitus the care of the mouth is important. The organisms found in the oral cavity thrive on the saccharin body fluids, and a fetid breath, stomatitis, and pyorrhea often result. Every diabetic patient should constantly and faithfully use a mouth-wash, and of these the liquor antisepticus alkalinus answers every requirement. The following prescriptions by Ortner are very useful:

℞—Beta naphthol,	gr. v;	
Sodium borate,	ʒ j;	
Peppermint water,	ʒ v;	
Distilled water,	O ij.	M.

Sig.—Use several times daily as a mouth-wash.

For stomatitis and painful gums the following is prescribed:

℞—Tincture of opium,	ʒ j;	
Potassium chlorate,	ʒ ijss;	
Sodium borate,	ʒ ijss;	
Orange-flower water,	ʒ j;	
Distilled water,	O ij.	M.

Sig.—Use as a gargle.—*New York Med. Journal.*

Dental Cysts.—A dental cyst which has suppurated is almost the only condition which simulates a chronic alveolar abscess, and this can be distinguished by its history and clinical signs. A dental cyst forms a smooth hemispherical swelling, more often situated on the outer than on the inner side of the alveolus, and rarely on both sides; its walls are resilient, or fluctuate where a bony covering is absent. The bone at its base is frequently arranged in a crater-like form, sending trabeculæ over its surface, and between these ribs of bone or trabeculæ the bony covering is thin and parchment-like or absent in places. The mucous membrane is thinned, but of a natural color, and freely movable over the cyst wall. There is an absence of all inflammatory signs, and a history often of some years' duration. In many cases the swelling has grown so gradually and painlessly that the patient has been unaware of its existence.

The presence of a dead tooth or the absence of a live one in association with the cyst is an important point in its differentiation, although the treatment of these two varieties of cyst, dental and dentigerous, is very similar.—F. Coleman, *St. Bartholomew's Hosp. Journ.* per *Dental Surgeon.*

Quick Repair of Rubber Dentures.—If a patient has no reserve plate, and hardly an hour's time to wait for the replacement of one or several teeth that have broken off the plate, the following method is available: If the pins are left, they are straightened, and the teeth are replaced after the holes for the pins have been deepened with a bur so as to reach the back of the rubber plate. If the pins are rather short, a small round or square figure is burred into the rubber from the back of the plate. This figure is filled with tin with the aid of a soldering iron, the tin is allowed to cool, is ground smooth, and the repair is finished.

If the pins are too short or one of them is broken, a new pin must be soldered to the tooth, or a new tooth has to be ground in place of the old one. In this case, it is better to bur out a little box behind the tooth instead of burring deep canals. This box is supplied with fairly deep retention points into which the liquid tin is pressed. The pins of the teeth to be replaced must be well roughened, and the teeth fixed with plaster. The soldering iron must be very pointed, and small pieces of chemically pure tin are soldered one after another, until the surface of the plate is reached. While the tin and rubber are still soft they are smoothed with a piece of leather or linen, beveled after cooling, and polished. As a flux, hydrochloric acid in which pure zinc has been dissolved is employed. The soldering iron is first dipped into the flux, then passed over a piece of sal ammoniac, and every piece of tin is introduced individually. This method affords a quick repair, and does not require any re-vulcanizing, thus not impairing the elasticity of the rubber.—*Zahnaerztliche Rundschau.*

Mouth-washes.—R. Bassenge has tested the antiseptic power of the mouth-washes most widely advertised (*Deutsche Medizinische Wochenschrift,* August 19, 1909). He points out that the claims made for these washes must be regarded with suspicion, in face of the fact that solutions of mercury perchlorid in concentrations of from 0.5 to 1 per 1000 fail to produce even temporary sterilization of the oral cavity. For the purposes of his experiments he chose those easily killed bacteria which are at times found in water, and which form the chief dangers to the human race—that is, cholera, typhoid, paratyphoid, dysentery, and diphtheria—and selected ten widely advertised mouth-washes. A glass of tap water (that is, 200 ccm.) which had been previously sterilized was infected with a broth culture of the various bacteria. First a control subcultured on ordinary sterile peptone broth was made. Then the measured quantity of the mouth-wash to be tested was added, and subcultures were made after the lapse of varying periods, partly on agar plates and partly in broth. He does not state whether any attempt was made to neutralize the disinfectant before making the subculture, and in the absence of any such statement it must be presumed that this was not done. The mouth-washes were allowed to act on the bacteria at the room temperature (59° F.), and at that of warm water (95° F.). No indication is given of the antiseptic supposed to be contained in the washes, save in the case of hydrogen dioxid. This solution was employed in a concentration of 10 per cent. The dilution of this in inoculating broth subcultures would be such as would exclude any inhibitory action of the oxidizing agent; but in the other cases this may not have been so. An inhibitory action is possible when a mere trace of some of the antiseptics, such as mercuric chlorid, is present. The following mouth-washes failed to kill typhoid bacilli at 95° F. within five minutes in the concentrations prescribed by the manufacturers: Desnos, Kothe's tooth-water, Odol, Ozonodont, Eau de Botot, Eau de Pierre, and listerine. Kosmodont killed the typhoid bacilli in three minutes, but failed to destroy cholera bacilli in the same time. Stomatol, it is stated, killed the typhoid bacilli in two minutes at 95° F. At room temperature the action was still less effective. Only hydrogen dioxid acted antiseptically within four minutes, this agent killing all germs within a few seconds in the concentration mentioned above. From this it will be seen that with the exception of the hydrogen dioxid preparation, the mixture of the advertised mouth-washes in a glass of water in the concentrations advertised must fail to kill dangerous pathogenic bacteria within four minutes, a space of time which would be longer than a person usually allows the water to be used for brushing his teeth to stand. If the bacteria are introduced into the mouth together with the mouth-wash, a further dilution will certainly take place, and even if the increased temperature favors the action of the mouth-wash, the bacteria would have a good chance of remaining alive. The water is rarely, if ever, kept in the mouth for five minutes, so that the results of Bassenge's investigations, so far as they go, would appear to justify the conclusion that mouth-washes can be of little use as disinfectants.—*Brit. Med. Journal* per *Drug Topics.*

HINTS, QUERIES, AND COMMENTS.

AN IDEAL CROWN FOR ANTERIOR TEETH.

PREPARE the root in the same manner as for a Richmond crown, being careful to remove all enamel. Make the band, floor, and pin just the same as for a Richmond crown—leaving, however, a little space between the floor and the root. Drill a hole through the top of the cap large enough to admit the end of a gold inlay sprue; then partly fill the cap with gold inlay wax, moisten the root with glycerin, heat the wax, and force the cap into place. When the wax is hard, adjust the sprue to the wax through the opening in the floor, and remove the whole with the sprue in position. Carefully trim the wax, and then invest and treat in the same way as a gold inlay. When the gold inlay process is completed, the edge of the band can be trimmed to a feather-edge without decreasing the strength of the crown. The facing is then soldered on in the usual way, and when completed, affords an ideal crown in regard to strength, durability, and hygiene.

O. W. BRINER, D.D.S.

New York, N. Y.

OBITUARY.

DR. DENNIS FRANK KEEFE.

DIED, at Providence, R. I., February 1, 1910, of apoplexy, DENNIS FRANK KEEFE, M.D., D.D.S., in his forty-fourth year.

Death claimed suddenly and unexpectedly Dr. D. F. Keefe, one of the most eminent dentists of Providence, R. I., who was seized with apoplexy on a street-car, and passed away in a few hours at the Rhode Island hospital.

Dr. Keefe was born in Worcester, Mass., on May 23, 1866. He received his early education in the public schools of that city, being graduated from the Worcester high school. He then entered the dental department of the University of the City of New York, from which institution he received the degree of D.D.S. in 1888. Soon after that he received the degree of M.D. from the College of Physicians and Surgeons.

His abilities being readily recognized, he was elected a member of the State Board of Registration in Dentistry, in which position he was retained for sixteen years, several times serving as president of the board. For twenty years he was attending dental and oral surgeon to the Rhode Island and St. Joseph's Hospitals, and at the time of his death was consulting dental and oral surgeon to both institutions. He was also at one time president of the New England Association of Dental Examiners and of the Rhode Island Dental Society. For several years he served as dental surgeon to the Rhode Island State Sanatorium for Tuberculosis and to the Providence District Nursing Association. He was also a member of the Northeastern Dental Association, the Rhode Island Dental Society, the Massachusetts Dental Society, and the New England Association of Dental Examiners.

In 1893 Dr. Keefe married Miss Lucy Cambell of Boston, who, with three daughters, Lucille, Alice, and Rose, survives him.

Dr. Keefe occupied the highest rank in public estimate both as a man and a dentist. He had strong convictions and was courageous in upholding them. He was a congenial, stanch, sympathetic friend and companion, a generous host and entertainer, an appreciative guest, a model husband and father, a patriotic citizen. His conceptions of the dental profession were most exalted, and he himself enjoyed an enviable reputation as an oral surgeon throughout the state. His years of service on the State Board of Examiners of

Rhode Island have been signally marked by untiring devotion to the duties entrusted to him by the state. He was particularly adapted to the work, being an excellent examiner, always showing remarkable wisdom, fairness, and judgment in the discharge of his duties.

Dr. Keefe was a member of St. Joseph's parish, and always took a deep interest in the affairs of that church. Interment was made in St. Francis cemetery.

Brief Necrology.

Dr. Alfred William Viney of Brooklyn, N. Y., January 16, 1910, in his thirty-second year, of pneumonia.

Dr. W. K. Christian of Moberly, Mo., January 7, 1910, in his seventy-third year, of pneumonia. The deceased was the oldest dentist of the state of Missouri.

Dr. Thomas Sturgis of Decatur, Ind., January 22, 1910, of Bright's disease. The deceased was a veteran of the civil war, and member of the G. A. R. Post of Decatur.

Dr. S. M. Hunt of Trenton, Tenn., January 9, 1910, in his thirty-third year, of tuberculosis. The deceased was a graduate of the Dental Department of Vanderbilt University.

Dr. George J. Hornung of Jersey City, N. J., January 17, 1910, in his forty-fourth year. The deceased was a graduate of St. Peter's College and of the New York College of Dentistry.

Dr. Henry F. Bishop of New York, N. Y., January 14, 1910, in his ninety-first year. The deceased was graduated from the Massachusetts Dental College in Boston, Mass., and after practicing in Worcester, Mass., for thirty years went to Hanover, Germany, and was elected court dentist. He was author of a "History of Lisbon, Conn., from Early Colonial Days."

Society Notes and Announcements.

DENTAL SOCIETY MEETINGS:

March, April, and May.

MARCH.

Aberdeen (S. D.) District Dental Society. Aberdeen. March 23d and 24th.

American Dental Society of Europe. Paris. Three days: March 25th to 28th.

Southwestern Nebraska Dental Society. Oxford. March 8th.

APRIL.

Connecticut State Dental Association. New Haven. Two days: April 19th and 20th.

Eastern Indiana Dental Association. Cambridge City. April 12th and 13th.

Odontological Society of Western Pennsylvania. Pittsburg. Two days: April 12th and 13th.

Southern Minnesota Dental Society. Mankato. Three days: April 11th to 13th.

Southwestern Michigan Dental Society. Coldwater. Two days: April 12th and 13th.

MAY.

Alabama Dental Association. Mobile. May 10th.

Canadian Dental Association and Ontario Dental Society. Toronto. Four days: May 31st to June 3d.

Illinois State Dental Society. Springfield. Four days: May 17th to 20th.

Indiana State Dental Association. Indianapolis. Three days: May 17th to 19th.

Iowa State Dental Society. Des Moines. Three days: May 3d to 5th.

Kansas State Dental Association. Topeka. Three days: May 17th to 19th.

Kentucky State Dental Association. Louisville. Three days: May 26th to 28th.

Lake Erie (Pa.) Dental Association. Cambridge Springs. Three days: May 17th to 19th.

Louisiana State Dental Society. New Orleans. Three days: May 9th to 11th.

Mississippi Dental Association. Jackson. Three days: May 24th to 26th.

Missouri State Dental Association. St. Louis. Four days: May 24th to 27th.

Montana State Dental Society. Great Falls. Two days: May 6th and 7th.

National Dental Association, Southern Branch, and Texas State Dental Association. Houston. Four days: May 3d to 6th.

Nebraska State Dental Society. Omaha. Three days: May 17th to 19th.

New Hampshire and Vermont Dental Societies. Rutland, Vt. Four days: May 17th to 20th.

New York State Dental Society. Albany. Three days: May 5th to 7th.

Texas State Dental Association and National Dental Association, Southern Branch. Houston. Four days: May 3d to 6th.

Vermont and New Hampshire Dental Societies. Rutland, Vt. Four days: May 17th to 20th.

Examiners' Meetings.

Alabama Board of Examiners. Mobile. May 9th.

Arizona Board of Examiners. Tucson. April 18th to 21st.

Massachusetts Board of Registration. Boston. March 2d to 4th.

Michigan Board of Examiners. Ann Arbor. June 20th to 25th.

Minnesota Board of Examiners. Minneapolis. March 15th to 17th.

New Jersey Board of Registration. Trenton. July 5th to 7th.

Texas Board of Examiners. Houston. June 13th.

West Virginia Board of Examiners. Wheeling. June 8th to 10th.

NATIONAL DENTAL ASSOCIATION MEETING

TO BE HELD AT

Denver, Col., July 19-22, 1910.

ORGANIZATION.

Officers.

Burton Lee Thorpe, St. Louis, Mo., *President.*

W. T. Chambers, Denver, Col., *Vice-president—West.*

C. W. Rodgers, Dorchester, Mass., *Vice-president—East.*

T. P. Hinman, Atlanta, Ga., *Vice-president—South.*

H. C. Brown, Columbus, Ohio, *Corresponding Secretary.*

Charles S. Butler, Buffalo, N. Y., *Recording Secretary.*

A. R. Melendy, Knoxville, Tenn., *Treasurer.*

Executive Committee.

J. D. Patterson, *Chairman,* Kansas City, Mo.

First Division—Committee on Arrangements.

J. D. Patterson, Kansas City, Mo.
C. M. Work, Ottumwa, Iowa.
W. G. Mason, Tampa, Fla.

Second Division—Committee on Credentials and Auditing.

V. H. Jackson, New York, N. Y.
H. B. McFadden, Philadelphia, Pa.
M. F. Finley, Washington, D. C.

Third Division—Committee on Voluntary Essays.

L. Meisburger, Buffalo, N. Y.
F. B. Kremer, Minneapolis, Minn.
C. J. Grieves, Baltimore, Md.

Executive Council.

H. J. Burkhart, *Chairman,* Batavia, N. Y.
A. H. Peck, Chicago, Ill.
B. Holly Smith, Baltimore, Md.
W. E. Boardman, Boston, Mass.
C. L. Alexander, Charlotte, N. C.
Burton Lee Thorpe, C. S. Butler (*ex-officio* members).

Organization of Sections.

Section I.

Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

Geo. H. Wilson, *Chairman,* Cleveland, Ohio.

Stanley L. Rich, *Vice-chairman,* Nashville, Tenn.

B. Frank Gray, *Secretary,* Los Angeles, Cal.

Section II.

Operative Dentistry, Nomenclature, Literature, Dental Education, and Allied Subjects.

L. L. Barber, *Chairman,* Toledo, Ohio.

Frank I. Shaw, *Vice-chairman,* Seattle, Wash.

F. L. Platt, *Secretary,* San Francisco, Cal.

SECTION III.

Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects.

WM. CARR, *Chairman*, New York, N. Y.

L. F. LUCKIE, *Vice-chairman*, Birmingham, Ala.

RICHARD SUMMA, *Secretary*, St. Louis, Mo.

Clinics.

F. O. HETRICK, *Chairman*, Ottawa, Kans.

HOWARD S. SEIP, *Vice-chairman*, Allentown, Pa.

L. A. CRUMLEY, *Secretary*, Birmingham, Ala.

J. E. CHACE, Ocala, Fla.

GEORGE E. SAVAGE, Worcester, Mass.

J. J. SARRAZIN, New Orleans, La.

H. H. SULLIVAN, Kansas City, Mo.

A. O. ROSS, Columbus, Ohio.

J. D. TOWNER, Memphis, Tenn.

J. B. HOWELL, Paducah, Ky.

L. B. MCLAURIN, Natchez, Miss.

J. H. LORENZ, Atlanta, Ga.

F. L. HUNT, Asheville, N. C.

J. G. FIFE, Dallas, Tex.

W. G. DALRYMPLE, Ogden, Utah.

R. D. ROBINSON, Los Angeles, Cal.

C. S. IRWIN, Vancouver, Wash.

F. R. HENSHAW, Indianapolis, Ind.

G. H. NOTTAGE, Portland, Ore.

F. L. WRIGHT, Wheeling, W. Va.

R. L. SIMPSON, Richmond, Va.

A. P. BURKHART, Buffalo, N. Y.

S. W. BOWLES, Washington, D. C.

T. M. HAMPTON, Helena, Mont.

J. BRUCE PERRIN, Des Moines, Ia.

Local Committee of Arrangements.

E. R. WARNER, *Chairman*, Denver, Col.

H. A. FYNN, *Vice-chairman*, Denver, Col.

W. P. SMEDLEY, Denver, Col.

W. A. BRIERLEY, Denver, Col.

W. W. FLORA, Colorado Springs, Col.

W. T. CHAMBERS (*ex-officio*), Denver, Col.

Chairmen of Sub-Committees.

Publicity—H. F. HOFFMAN, Denver, Col.

Clinics—A. W. STARBUCK, Denver, Col.

Exhibits—JOHN STEELE, Denver, Col.

Entertainment—I. C. BROWNLIE, Denver, Col.

NATIONAL DENTAL ASSOCIATION—SOUTHERN BRANCH AND THE TEXAS STATE DENTAL ASSOCIATION.

CHANGE OF DATE OF MEETING.

THE thirteenth annual meeting of the Southern Branch of the National Dental Association will be held in Houston, Texas, Wednesday, May 4, 1910, continuing in session three days. The association has accepted the invitation of the Texas State Dental Association to meet conjointly with them and as their guests.

The officers and members are actively at work, and a most instructive program is being arranged. A preliminary program will be announced later.

CARROLL H. FRINK, *Recording Sec'y*,
301 Masonic Temple, Jacksonville, Fla.

THE annual meeting of the Texas State Dental Association will be held at Houston, Texas, May 3, 1910. On May 4, 5, and 6 the association will hold a joint meeting with the Southern Branch of the National Dental Association, at the same place. The profession is cordially invited to visit Texas on this occasion.

J. G. FIFE, *Sec'y*,
Dallas, Texas.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

CHANGE OF DATE OF MEETING.

THE twenty-eighth annual session of the National Association of Dental Examiners will be held at the new Savoy Hotel, Denver, Col., commencing Monday, July 25, 1910, at 10 A.M. The rates will be $2.00 per day for one and $3.00 per day for two persons in room, European plan; large room for one or two with private bath $4.00 and $5.00 per day. Meeting and committee rooms at the service of the association, free, and every accommodation extended.

An early mail reservation is requested, the time being the busy season. A full representation from every state in the United States is earnestly desired.

J. J. WRIGHT, *President*,
Wells bldg., Milwaukee, Wis.

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

AMERICAN DENTAL SOCIETY OF EUROPE.

The thirty-seventh annual meeting of the American Dental Society of Europe will be held in Paris, France, on March 25, 26, and 28, 1910, at the Hotel Continental.

A most cordial invitation is extended to members of the profession to be present.

T. G. Patterson, *Hon. Sec'y*,
2 Quai des Eaux-Vives, Geneva, Switzerland.

SOUTHWESTERN NEBRASKA DENTAL SOCIETY.

The fifth semi-annual meeting of the Southwestern Nebraska Dental Society will be held at Oxford, Neb., Tuesday, March 8, 1910. Dr. C. Woodbury will be with us. All ethical practitioners are invited to meet with us.

W. A. McHenry, *Sec'y*,
Nelson, Neb.

STATE UNIVERSITY OF IOWA

Alumni Dental Association.

The annual meeting of the Alumni Dental Association of the State University of Iowa will be held at Iowa City, on March 8 and 9, 1910. All ethical practitioners, whether alumni of the Dental Department of the State University or not, are urged to be present. "Come, let us reason together."

H. H. Gardner, *Sec'y*,
Williamsburg, Iowa.

ABERDEEN (S. D.) DISTRICT DENTAL SOCIETY.

Midwinter Clinic.

The Aberdeen District Dental Society will hold its annual midwinter clinic at Aberdeen, S. D., March 23 and 24, 1910. Prominent members of the profession from various sections of the country will be present, and the largest manufacturers' display ever held west of the Twin Cities is being planned. Grand ball and banquet on the evening of the 23d.

Bring your wife. You cannot afford to miss this meeting.

Carl Fossume, *Ch'man of Clinic*,
19 Wells bldg., Aberdeen, S. D.

SOUTHWESTERN MICHIGAN DENTAL SOCIETY.

The annual meeting of the Southwestern Michigan Dental Society will be held at Coldwater, Mich., April 12 and 13, 1910.

C. W. Johnson, *Sec'y*,
Lawton, Mich.

SOUTHERN MINNESOTA DENTAL SOCIETY.

The twenty-fifth annual meeting of the Southern Minnesota Dental Society will be held in the Saulpaugh Hotel, Mankato, Minn., April 11, 12, and 13, 1910.

C. A. Hintz, *Sec'y*.

CONNECTICUT STATE DENTAL ASSOCIATION.

The next annual meeting of the Connecticut State Dental Association will be held in Warner Hall, New Haven, Conn., April 19 and 20, 1910.

R. H. W. Strang, *Sec'y*,
Bridgeport, Conn.

EASTERN INDIANA DENTAL ASSOCIATION.

The Eastern Indiana Dental Association will hold its thirty-ninth annual meeting at Cambridge City, Ind., on April 12 and 13, 1910.

Following are the officers: Charles Kneise, president, Cambridge City; C. C. Miller, vice-president, Plainfield, Ind.; A. O. Martin, secretary, Richmond, Ind.; Excutive Committee—W. B. Harris, Cambridge City, Ind. Superintendent of Clinics—R. C. Leslie, Cambridge City.

A. O. Martin, *Sec'y*.

ODONTOLOGICAL SOCIETY OF WESTERN PENNSYLVANIA.

The Odontological Society of Western Pennsylvania will hold its twenty-ninth annual meeting at the Monongahela House, Pittsburg, Pa., April 12 and 13, 1910.

The program includes papers by Dr. J. Leon Williams of London, England, Dr. J. P. Buckley of Chicago, and others. A large list of clinics is being prepared and the "biggest ever" meeting is expected.

A large hall is reserved for exhibitors and many new and interesting exhibits will be

shown. Spaces may be reserved by application to Dr. W. W. Booth of Carnegie, Pa.

All ethical dentists are invited to attend this meeting and join the society. For information address

Program Committee—Dr. C. E. Peters, Fulton bldg., Pittsburg; Dr. J. H. Crawford, Diamond Bank bldg., Pittsburg, Pa.

Exhibit Committee—Dr. W. W. Booth, Carnegie.

Membership Committee—Dr. Jno. F. Biddle, Arch st., N. S., Pittsburg.

KANSAS STATE DENTAL ASSOCIATION.

THE next annual meeting of the Kansas State Dental Association will be held in Topeka, Kans., May 17, 18, and 19, 1910.

EDWARD BUMGARDNER, *Sec'y.*

LOUISIANA STATE DENTAL SOCIETY.

CHANGE OF DATE OF MEETING.

THE thirty-second annual meeting of the Louisiana State Dental Society will be held at the Grunewald Hotel, in New Orleans, La., May 9, 10, and 11, 1910.

W. C. RICHARDSON, *Sec'y Ex. Com.*

INDIANA STATE DENTAL ASSOCIATION.

THE fifty-second annual meeting of the Indiana State Dental Association will be held in Indianapolis, May 17 to 19, 1910, at the Claypool Hotel. This promises to be a great meeting.

OTTO U. KING, *Sec'y,*
Huntington, Ind.

ILLINOIS STATE DENTAL SOCIETY.

THE forty-sixth annual meeting of the Illinois State Dental Society will be held in Springfield, May 17, 18, 19, and 20, 1910.

In addition to an especially good list of essays and clinics, an unusually attractive supply exhibit is being planned.

J. F. F. WALTZ, *Sec'y,*
Decatur, Illinois.

VERMONT AND NEW HAMPSHIRE DENTAL SOCIETIES.

JOINT MEETING.

THE Vermont and New Hampshire Dental Societies will hold a joint meeting at Rutland, Vt., May 17 to 20, 1910.

HARRY F. HAMILTON, *Sec'y,*
Newport, Vt.

IOWA STATE DENTAL SOCIETY.

THE forty-eighth annual meeting of the Iowa State Dental Society will be held at Des Moines, May 3, 4, and 5, 1910. Besides an especially strong program, plans are being made for a large dental manufacturers' exhibit. Display space free of charge.

W. G. CRANDALL, *Sec'y,*
Spencer, Iowa.

LAKE ERIE (PA.) DENTAL ASSOCIATION.

THE forty-seventh annual meeting of the Lake Erie Dental Association will be held at Hotel Rider, Cambridge Springs, Pa., May 17, 18, and 19, 1910. All reputable practitioners are cordially invited to attend.

V. H. MCALPIN, *Sec'y.*

MISSISSIPPI DENTAL ASSOCIATION.

THE seventeenth annual meeting of the Mississippi Dental Association will be held in Jackson, in the Senate chamber of the Capitol, May 24 to 26, 1910. All ethical dentists are invited.

L. B. PRICE, *Sec'y,*
Corinth, Miss.

KENTUCKY STATE DENTAL ASSOCIATION.

THE forty-first annual meeting of the Kentucky State Dental Association will be held in Louisville, May 26, 27, and 28, 1910.

An unusually interesting and profitable program is being arranged for this year, and a cordial invitation is extended to all ethical members of the profession.

W. M. RANDALL, *Sec'y,*
Cor. Brook and Broadway, Louisville, Ky.

PENNSYLVANIA STATE DENTAL SOCIETY.

The Pennsylvania State Dental Society will hold its next annual meeting in the Board of Trade Building, 112-116 Market st., Harrisburg, June 28, 29, and 30, 1910.

Luther M. Weaver, *Recording Sec'y*,
Philadelphia, Pa.

MASSACHUSETTS DENTAL SOCIETY.

The Massachusetts Dental Society will hold its forty-sixth annual meeting at Springfield, June 8, 9, and 10, 1910. An attractive program will be presented.

Ethical practitioners of dentistry residing in the state of Massachusetts who may desire to join the society are requested to send their names and addresses to

Charles W. Rodgers, *Sec'y*,
165 Harvard st., Dorchester, Mass.

UNIVERSITY OF ILLINOIS COLLEGE OF DENTISTRY.

Alumni Association.

The Alumni Association of the College of Dentistry, University of Illinois, will hold their third annual clinic and meeting on Wednesday, June 1, 1910, in the college building, corner Harrison and Honore sts. This will be a strictly alumni clinic, but ethical members of the profession are extended an invitation to be present.

Frank J. Ryan, *Sec'y*.

CALIFORNIA STATE DENTAL ASSOCIATION.

The thirty-seventh annual meeting of the California State Dental Association will be held in San Francisco, June 27, 28, and 29, 1910. An interesting program of papers and clinics is being arranged, and it will be one of the most instructive meetings ever held on the coast. Eastern friends are invited to attend on their way to Denver.

C. E. Post, *Sec'y*,
San Francisco, Cal.

MAINE DENTAL SOCIETY.

The next meeting of the Maine Dental Society will be held June 22 to 24, 1910, at the Rangeley Lake House, Rangeley, Me.

I. E. Pendleton, *Sec'y*.

NORTH CAROLINA DENTAL SOCIETY.

The thirty-sixth annual meeting of the North Carolina State Dental Society will be held July 13 to 16, 1910, at Wrightsville, N. C. The Seashore Hotel will be the headquarters.

Arthur H. Fleming, *Sec'y*,
Louisburg, N. C.

VIRGINIA STATE DENTAL ASSOCIATION.

The forty-first annual session of the Virginia State Dental Association will be held at Staunton, Va., July 20 to 22, 1910.

Every effort is being made to make this the most interesting and successful meeting of our society. Men of national reputation will give clinics and read papers. All ethical practitioners are cordially invited to attend.

W. H. Pearson, *Corr. Sec'y*,
Hampton, Va.

ST. LOUIS SOCIETY OF DENTAL SCIENCE.

Dinner in Honor of Dr. D. O. M. LeCron.

On January 18th a dinner was given in St. Louis, at the Hotel Jefferson, in honor of Dr. D. O. M. LeCron, by the St. Louis Society of Dental Science.

Dr. LeCron was presented with a beautiful "loving cup," as a token of the love and esteem of his fellow practitioners, and to show their appreciation of the great service he has rendered to them and to his profession at large by the numberless experiments and excursions which he has made into the field of original research, and which have contributed so largely to the present high efficiency of dental practice.

J. P. Marshall, *Sec'y*.

LUZERNE AND LACKAWANNA DENTAL SOCIETY.

At the annual meeting of the Luzerne and Lackawana (Pa.) Dental Society, held at Wilkes-Barre in December, the following officers were elected for 1910: O. B. Richards, Moosic, president; D. B. Williams, Wilkes-Barre, vice-president; W. C. Schofield, Wilkes-Barre, secretary, and Lewis Rinsland, Scranton, treasurer. It was also decided to become a component part of the state society of Pennsylvania.

W. C. Schofield, *Sec'y*,
Wilkes-Barre, Pa.

MASSACHUSETTS BOARD OF REGISTRATION.

A meeting of the Massachusetts Board of Registration in Dentistry, for the examination of candidates, will be held in Boston, Mass., March 2, 3, and 4, 1910. Applications may be obtained from

G. F. Mitchell, *Sec'y*,
Haverhill, Mass.

WEST VIRGINIA BOARD OF EXAMINERS.

The West Virginia State Board of Examiners will hold a meeting at Wheeling, W. Va., June 8, 9, and 10, 1910. Applicants for examination must file their applications, together with the fee of twenty-five dollars.

For blanks and other information address

J. Fleetwood Butts, *Sec'y*,
Charleston, W. Va.

MICHIGAN BOARD OF EXAMINERS.

The next regular meeting of the Michigan State Board of Dental Examiners for the examination of applicants for registration will be held at Ann Arbor, Mich., beginning Monday, June 20th, and continuing until the 25th. Applications must be in the hands of the secretary at least fourteen days before the examination, and should be addressed to

A. W. Haidle, *Sec'y*,
Negaunee, Mich.

MINNESOTA BOARD OF EXAMINERS.

The next regular meeting of the Minnesota State Board of Dental Examiners will be held at the dental department of the State University in Minneapolis on March 15, 16, and 17, 1910.

All applications must be in the hands of the secretary ten days previously. All applicants must be graduates and present their diploma. Those having practiced in any of the following states for five years or more will be exempt from the theoretical examination: Iowa, Indiana, Michigan, Nebraska, Wisconsin, or Montana. Minnesota dentists are admitted to those states on the same conditions.

For blanks and further information apply to

Dr. Geo. S. Todd, *Sec'y*,
Lake City, Minn.

ARIZONA BOARD OF EXAMINERS.

There will be a meeting of the Arizona Board of Dental Examiners, April 18 to 21, 1910, at Tucson, Ariz.

Candidates should have in their application, and fee of $25.00 should accompany same, at least twenty days before meeting. Theoretical examination includes the following subjects: Anatomy, physiology, chemistry, materia medica, therapeutics, metallurgy, histology, pathology, operative and mechanical dentistry, oral surgery; practical demonstration of skill in operative and mechanical dentistry will also be required, and candidates should come prepared with instruments and material for making fillings and crowns in the mouth.

W. A. Baker, *Sec'y*.

ALABAMA BOARD OF EXAMINERS.

The Board of Dental Examiners for the state of Alabama will meet in Mobile, Ala., on the Monday before the second Tuesday in May 1910. In addition to the regular written examination, the following requirements will be added: Each applicant must fill at least two teeth, approximal cavities, one with gold, the other with alloy, work to be done under the immediate supervision of the board, the latter to determine or pass on suitable selections of cavities. The boards will try to furnish subjects, but failing to do so, applicants for license must find or bring their own subjects, also instruments and material.

Each applicant must take or have taken an impression of their own mouth, make a plaster cast of the same, cut from the cast the six anterior teeth, and make a bridge for the same with porcelain facings. Cast can be

made and facings fitted before the examination, but the backings must be put on and facings arranged, also invested and soldered, under the supervision of the board, hard solder being required; or the applicant must pass any other test the board may desire.

THOS. P. WHITBY, *Sec'y.*

TEXAS BOARD OF EXAMINERS.

THE regular meeting of the Texas State Board of Dental Examiners will be held in Houston, Texas, beginning 9 A.M. Monday, June 13, 1910. Diplomas not recognized or registered; examination required of all. No interchange of license with any other state. No special examination to practitioners already in active practice. Applications, accompanied by a fee of twenty-five dollars, should be in the secretary's hands by June 10th.

For further information address,

BUSH JONES, *Sec'y,*
Dallas, Texas.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the Assembly chamber of the State-house at Trenton, N. J., July 5, 6, and 7, 1910. Practical work on the 5th, and the theoretical examination the 6th and 7th. All applications must be in the hands of the secretary ten days prior to the meeting. Applicants must send preliminary credentials and photograph with the application, or it will not be accepted.

Sessions begin promptly at 8 A.M. each day.

CHAS. A. MEEKER, D.D.S., *Sec'y,*
29 Fulton st., Newark, N. J.

ILLINOIS CIVIL SERVICE COMMISSION.

EXAMINATIONS FOR DENTAL INTERNES, ETC.

EXAMINATIONS will be held for the following positions in the State charitable institutions at 9 A.M. Wednesday, March 30, 1910:

Dental interne. Open to men and women over twenty-one. Scope and weights: Anatomy of the head and neck, dental anatomy, operative dentistry, prosthetic dentistry, dental pathology, oral surgery and oral hygiene, 7; experience, 3.

Pharmacist. Open to regularly licensed pharmacists over twenty-one. Experience, 4; technical questions on pharmacy, 6.

Engineer. Open to men over twenty-three. Experience, 3; mechanical ability, steamfitting and electrical work, 3; boiler-room practice, steam engines and their care, steam heating, 3; English branches, 1.

The above examinations will be held in the following cities: Chicago, Elgin, Kankakee, Watertown, Peoria, Jacksonville, Lincoln, Anna, Aurora, Belleville, Bloomington, Cairo, Canton, Centralia, Clinton, Charleston, Effingham, Galesburg, Golconda, Harrisburg, Macomb, Marion, Mt. Carmel, Mt. Vernon, Olney, Ottawa, Pana, Paris, Paxton, Quincy, Rockford, Sterling, Urbana, Springfield, and Vandalia.

Address requests for applications to the Illinois Civil Service Commission, Springfield. All applications must be filed by March 23d.

JOSEPH C. MASON, *Chief Examiner.*
Springfield, Ill., January 21, 1910.

EXAMINATIONS FOR DENTAL SURGEONS, U. S. ARMY.

AT FORT SLOCUM, N. Y., AND FORT McDOWELL, CAL.

AN examination will be authorized to be held at Fort Slocum, N. Y., and Fort McDowell, Cal., beginning Monday, March 7, 1910, with a view to establishing a list of eligibles from which employment as dental surgeon, U. S. army, will be given as occasion may require, in the order of general average attained by the applicants. The full examination will cover a period of from ten days to two weeks.

Applicants will be authorized to present themselves at the nearest military post at which a commissioned medical officer is stationed, for examination as to physical qualifications for employment as dental surgeon. Any physical defect which would disqualify an applicant for a commission or for enlistment in the army will be sufficient to reject an applicant for dental surgeon.

It must be distinctly understood that all expenses entailed by the journey, for physical examination, and to, from, and while at the place of professional examination, must be borne by the applicant; there are no public

funds from which any part of such expenses can be paid.

Application blanks can be procured upon application to the Surgeon-general of the army.

ARMY DENTAL CORPS.

MEMORANDUM of changes of stations and duties of dental surgeons, U. S. army, for the week ending January 29, 1910:

S. Davis Boak, January 18th, reported for duty at Army General Hospital, San Francisco, Cal.

Robert T. Oliver, examining and supervising dental surgeon, January 21st, reports arrival at Fort Monroe, Va., on temporary duty.

R. H. Rhoades, January 26th, left Columbus Barracks, Ohio, *en route* to the Philippine Islands, for duty.

Robert H. Mills, January 27th, left from temporary duty at Watertown Arsenal, Mass., *en route* to Fort H. G. Wright, N. Y., for temporary duty.

For the week ending February 5th:

John A. Hess, examining and supervising surgeon, left from duty at Army General Hospital, San Francisco, Cal., for station and duty at Fort McDowell, Cal.

George I. Gunckel, returned to Fort McPherson, Ga., from leave of absence.

E. P. R. Ryan, left Fort D. A. Russell, Wyo., for thirty days' leave of absence.

For the week ending February 12th:

Robert H. Mills, February 6th, reports for temporary duty at Fort Terry, N. Y.

John R. Ames, February 3d, reports for temporary duty at Fort Yellowstone, Wyo.

George I. Gunckel, February 4th, reports for temporary duty at Fort Morgan, Ala.

Robert H. Mills, February 9th, relieved from duty at Fort Adams, R. I., and will proceed to San Francisco, Cal., and take the transport to sail from that place about June 5, 1910, for the Philippine Islands, and upon arrival at Manila will report to commanding general, Philippines Division, for assignment to duty.

F. Homer Wolven, February 9th, relieved from duty in the Philippines Division and will proceed on the transport to sail from Manila, P. I., on or about June 15, 1910, to San Francisco, Cal., and upon arrival will report by telegraph to the Adjutant-general of the army for further orders.

For the week ending February 19th:

George D. Graham, ordered to proceed from Fort Leavenworth, Kans., to Fort Crook, Neb., for temporary duty for such time as his services may be required at that station.

Robert H. Mills, left from temporary duty at Fort Terry, for temporary duty at Fort Jay.

Robert H. Mills, reported for temporary duty at Fort Jay, N. Y.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JANUARY 1910.

January 4.

No. 945,194, to FRANK RITTER. Dental chair.

No. 945,713, to CHAS. P. FRITZ. Dental scraper.

January 18.

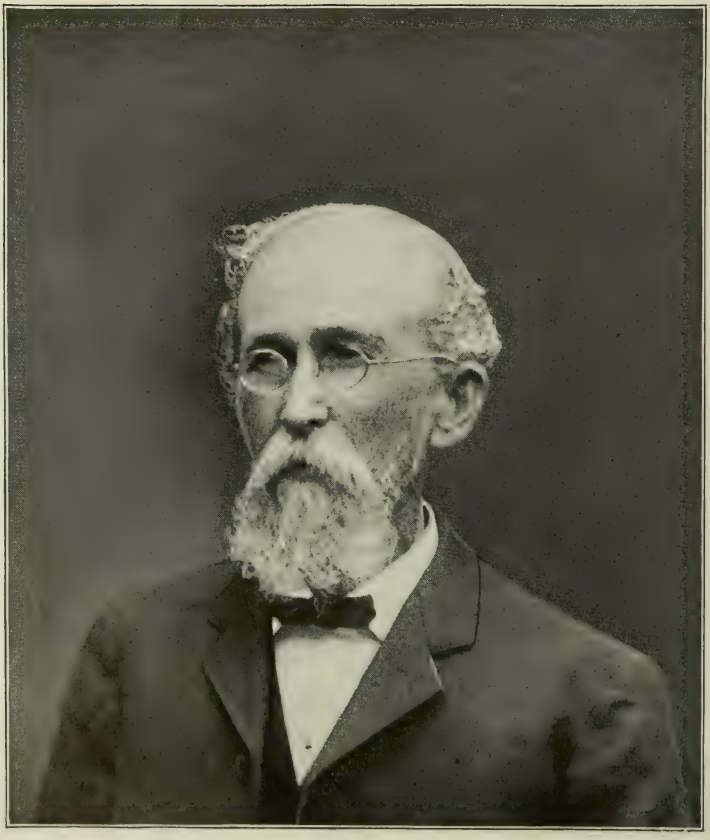
No. 946,677, to J. P. and F. A. LEDERLE. Means for casting dental fillings.

No. 946,962, to WM. H. GRAHAM. Dental crown-swaging device.

No. 947,120, to W. L. MORRISON. Dentifrice.

January 25.

No. 947,378, to THOS. E. DIMELOW. Fastening means for artificial teeth.



DR. A. W. ALEXANDER.

THE

DENTAL COSMOS.

VOL. LII. APRIL 1910. No. 4.

ORIGINAL COMMUNICATIONS.

THE ADVENTITIOUS EFFECT OF LARGE MASSES OF GOLD IN CONTACT WITH TOOTH TISSUES.

By I. N. BROOMELL, D.D.S., Philadelphia.

(Read before the First District Dental Society of the State of New York, at its regular monthly meeting, November 9, 1909.)

EVER since the introduction of crown and bridge work into the dental profession there has been more or less discussion in regard to the deleterious effect of large masses of gold in contact or nearly in contact with vital tooth tissues. Some operators have contended that no bad results would follow such operations, while others have been equally confident that the good offices of the supporting teeth would be naturally interfered with by completely or partially boxing them in with gold.

The former class, true to their convictions, have not hesitated to attach large or small bridges to vital teeth either by partial or entire gold caps, while the latter class have invariably devitalized the pulp before performing similar operations.

Clinical experience in general in regard to the ultimate effect of these operations has been such that deductions widely at variance have been arrived at. We have all had cases in which the vitality of the pulp has been lost in the course of time, under partial or full gold caps; likewise we have also had many cases in which under similar conditions the pulps have remained *apparently* undisturbed. In view of what it is proposed to relate in this paper, the qualifying word in the foregoing sentence cannot be too forcibly emphasized, that is, the pulps are *apparently* undisturbed.

As a result of the microscopic study of a number of cases it is proposed to show that almost invariably the pulp tissue, and as well the enamel, dentin, and alveolo-dental membrane, are all more or less affected in various ways by such unnatural surroundings. Among the morbid effects produced are hyperemia of the pulp, dry gangrene of the pulp, calcification of the pulp tissue, sclerosis of the bloodvessels of the pulp, atrophy of the pulp, pulp nodules, secondary dentin, expansion of the dentinal tubules,

with corresponding bulging of the dentinal fibers, pathologic pigmentation of the enamel and dentin, non-carious destruction of the enamel, as well as destruction by caries and perhaps a molecular change in this tissue. Any one of the foregoing may be the primary affection after which a train of pathic conditions may ensue.

It is interesting to study these various pathologic changes as they take place in the tooth tissues, producing as they do a series of phenomena of both scientific and practical interest.

The first case to be investigated was that of a pin and plate bridge (Fig. 1), constructed after a somewhat peculiar fashion, the intervening tooth, or tooth of replacement, being the natural one which formerly occupied the space. The history of this case does not differ materially from many others under similar conditions, the left central being the first to yield to a pyorrheic affection, followed shortly by the shedding of the two adjoining teeth—those supporting the bridge—from the same cause.

Fig. 1.



Notwithstanding the fact that the bridge-piece was retained but a short time, it was present sufficiently long to materially affect through the rather extensive gold abutments the pulps and structural arrangement of the dentin.

Before introducing slides illustrative of pulp pathology, let us first examine the cellular elements of a normal pulp, a very good specimen of which is shown in Fig. 2. Characteristic of the normal tissue are the so-called round or pulp cells, retaining in a measure through health an almost embryonic simplicity, and occupying the center of the protoplasm-like mass; then the single layer of specialized cells, the odontoblasts, with their processes reaching far out into the substance of the dentin as the dentinal fibers.

Fig. 3 shows a section of the pulp of the central incisor which supported the bridge-piece previously shown. An examination shows the pulp cells more or less atrophied and without form; the odontoblasts are closely packed together, and are in almost immediate contact with the calcified dentin, which is deeply pigmented, especially immediately beneath the surface used for attachment. Evidently the delicate pulp structure has made every effort to defend itself.

Fig. 4 shows a longitudinal section of the same pulp, and while this is under low power, its vascular supply is a pronounced feature. The vessels are dilated, denoting a chronic inflammation of the tissue, resulting no doubt from prolonged irritation through thermal stimulation.

Fig. 5 shows some of the sclerotic vessels of the pulp in transverse section. Evidently an inflammation of a low grade has persisted in this pulp for some time, and with the atrophy of the cellular elements noted before there is a marked increase in its fibrous tissue.

While in this particular case the conducting substance was bulky and comparatively closely associated with the pulp, this is by no means an essential feature in producing a hyperemia, because in many instances similar results follow in relatively shallow cavities, through thermal irritation of the dentinal fibers. In fact, it may be a question whether or not this superficial irritation may not more frequently result in arterial hyperemia of the pulp on account of the more highly organized condition of the dentin at its periphery.

Fig. 2.

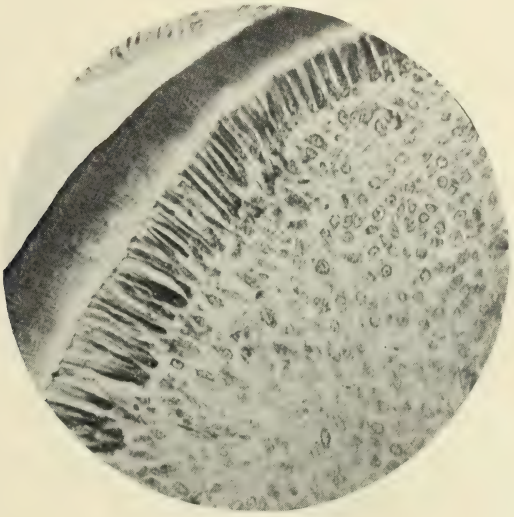


Fig. 3.

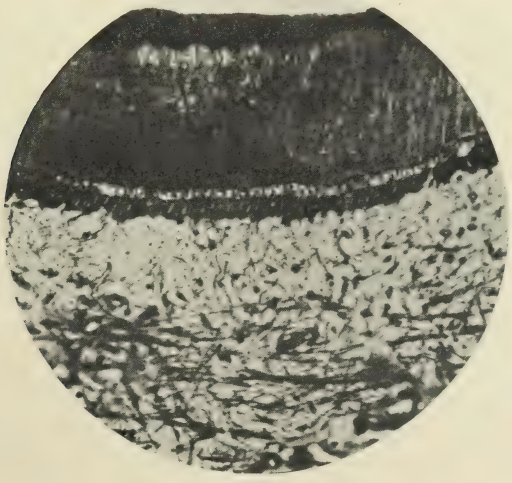
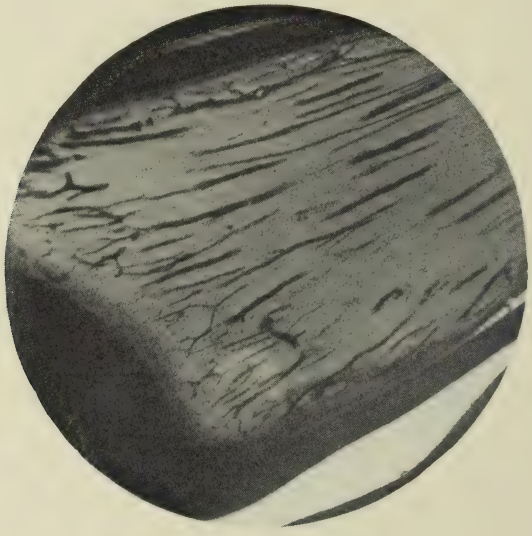


Fig. 6 shows a section of normal pulp-vessels. The cardinal principle in the

treatment of all inflammatory affections of the pulp being first the removal of the exciting cause, in this instance, recalling the nature of the case, we could scarcely expect successful ra-

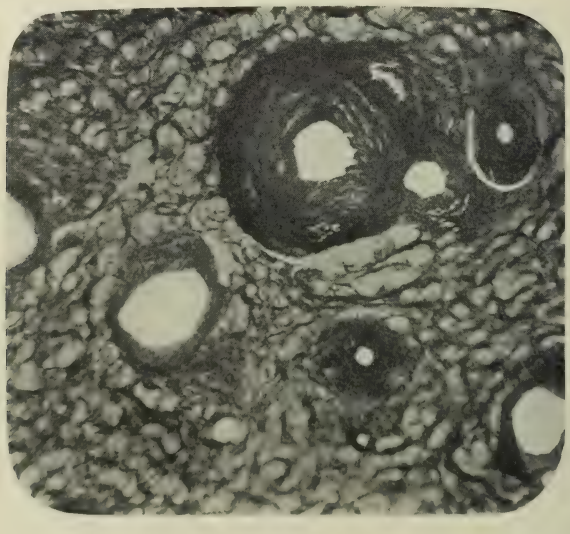
Fig. 4.



tional treatment. Instead of this the emergency could be fairly met with a devitalization of the pulp only, a procedure which could have been carried out to very much better advantage when the operation was first performed.

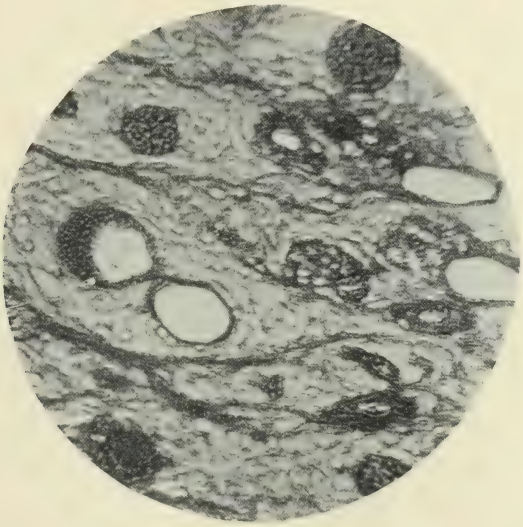
It so happened in this instance, as it does no doubt in the majority of similar cases, that the pulp congestion was accompanied with little or no pain. This fact does not preclude, but it actually

Fig. 5.



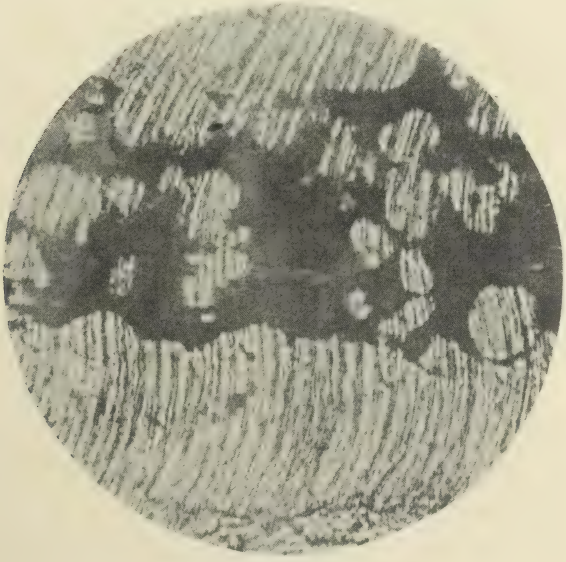
favors, the possibility of the eventual death of the pulp, this taking place so

Fig. 6.



gradually and so peacefully that a knowledge of its existence comes to light only

Fig. 7.



with the beginning of suppuration. Not only were the pulps of these teeth

affected, but the integrity of the dentin and enamel as well. While no history of syphilitic nature was to be found nor suspected, a great bulk of the dentin of one of these teeth (Fig. 7) had an appearance quite similar to syphilitic den-

tin, from the presence of numerous and particularly large interglobular spaces, common to dentin in this disease.

stance, they invite the invasion of bacteria after these have once gained entrance into the tubuli.

Fig. 8.

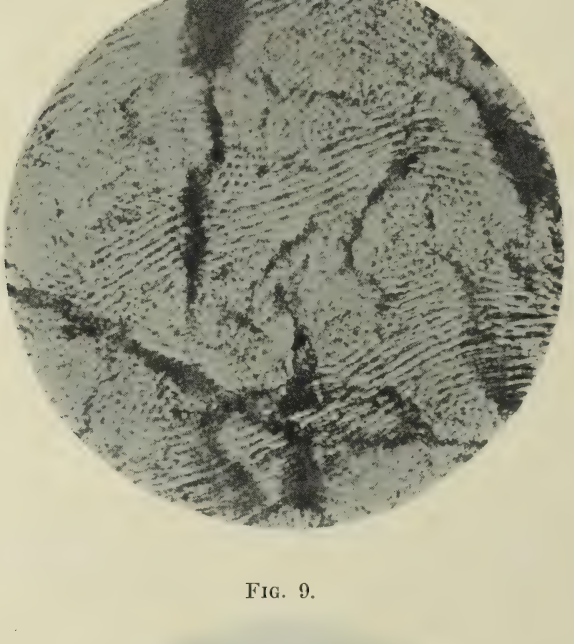
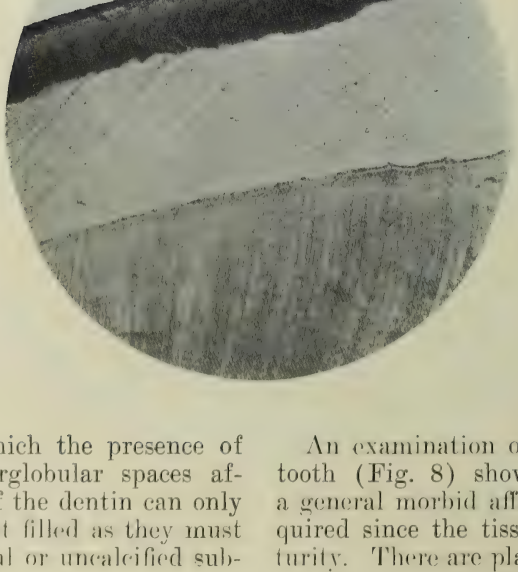


Fig. 9.



The extent to which the presence of these so-called interglobular spaces affects the structure of the dentin can only be approximated, but filled as they must be with a transitional or uncalcified sub-

An examination of the enamel of the tooth (Fig. 8) showed the presence of a general morbid affection, evidently acquired since the tissue had reached maturity. There are plainly evident lacuna-

like spaces, quite similar to those found in acquired syphilitic enamel. Local conditions no doubt played an important part in the direct causation of these affected areas, which on account of the peculiar reddish-brown color cannot be considered caries.

Thinking that some interest might be attached to the intervening natural tooth, which it will be recalled had been extracted, and swung in the space by cementing it to the gold backing, a ground section was made, which shows the dentin to be normal with practically

Fig. 10.

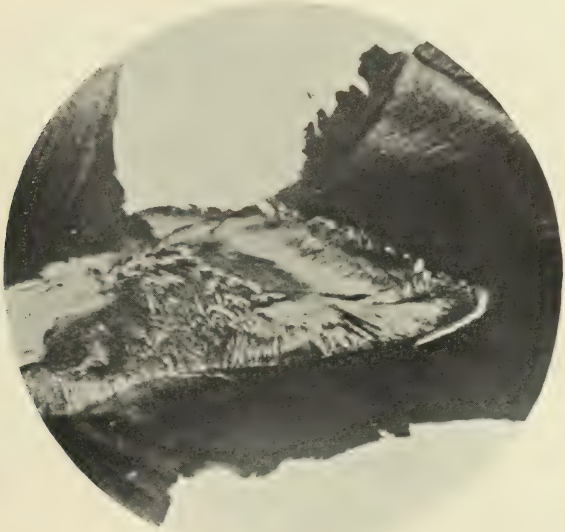


Fig. 11.



no interglobular spaces. (Fig. 9.) The enamel was also normal save for a peculiar greenish stain, which had penetrated its substance to the extent of about one-fourth of its entire thickness.

Fig. 10 shows a section of the crown of a cuspid which for several years carried a large gold filling on its distal and labial surfaces, as well as having its lingual surface covered with gold to prevent further destruction through mechanical abrasion, the tooth finally being extracted because of a persistent and uncontrollable fistula.

The section here shown speaks for itself. There has evidently been a chronic

Fig. 12.

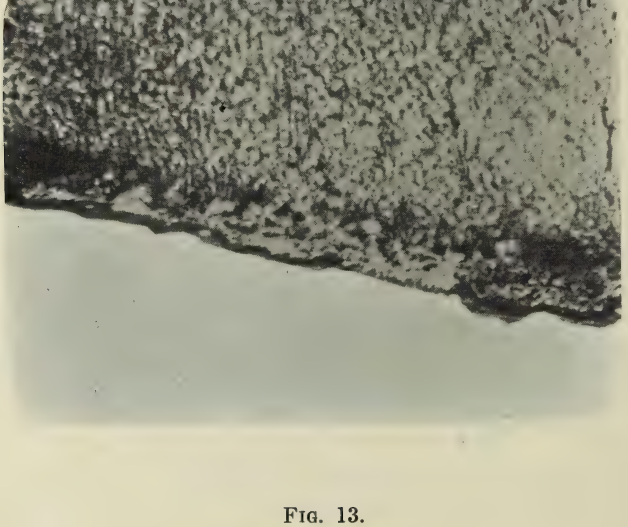
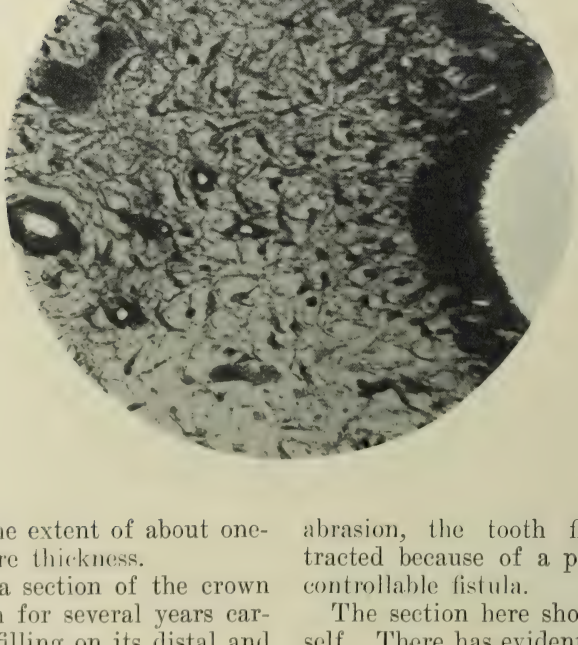


Fig. 13.



suppurative pulp, followed by atrophy, and finally complete calcification of the tissue.

A thin section of the dentin of this tooth was examined after decalcification, and the microscope revealed adventitious dentin of a peculiar character. The dentinal fibers showed club-like enlargements, to accommodate which there must have been a corresponding increase in the diameter of the tubules, most likely a process of decalcification. Such a condition as this could readily be attributed to a prolonged inflammatory condition of the pulp through over-stimulation of its peripheral cells by the odontoblasts.

The next specimen (Fig. 11) is one which shows the possibility of the disintegration of enamel under a layer of zinc-phosphate cement, the section being made from a tooth which supported a bridge abutment. In lifting the bridge from the tooth there appeared to be no disintegration of the cement, the surface of the tooth supposedly being perfectly protected, and therefore free from the possibility of a breakdown. Perhaps most authorities would consider the destruction of enamel here shown to be a true carious process, but from its appearance under low as well as high power, it gives evidence of a simple destruction of the interprismatic substance, from the effects of which the enamel rods have fallen apart, a gradual destruction of tissue resulting. In Fig. 12 is additional evidence to the effect that the enamel is not always shielded from destructive influences when masses of gold are attached to it through the medium of a phosphate cement. This is a ground section from the crown of a bicuspid, the patient being but twenty-eight years of age. The gold crown had been in place only five years, and its removal from the tooth after extraction showed no evidence of the disintegration of the cement. In a very young tooth we might almost consider the affected area at the periphery of the enamel to be its transformed cortical layer, but not so in a tooth past maturity.

It is a generally accepted theory that while enamel may suffer through mechanical or chemical injury, it can undergo no constructive changes or retrograde metamorphosis. Under certain favorable conditions of environment a molecular change is possible, and is believed to be what has taken place in this and the previous case. It may be a question as to how destructive such a condition may eventually prove to be, but one thing is certain: sooner or later bacterial action will set in, followed by the usual disastrous results.

While it has been intimated that most pathic conditions in the tooth tissues through mechanical influences are slow and insidious, this by no means excludes the possibility of similar disturbances developing more or less rapidly, such acute results being shown in the following interesting case.

The patient was a woman about forty-five years of age, of highly nervous temperament, with teeth hypersensitive under normal conditions.

A gold crown was placed over a lower bicuspid, free from cavities of decay, requiring but little destruction of tissue before setting. Certainly there was no exposure of the terminal branches of the dentinal fibers. Within twenty-four hours marked symptoms of acute inflammation of the pulp appeared—so pronounced, in fact, that the crown had to be removed.

In ten days the crown was again placed in position with similar results, this time so severe that the patient had the tooth extracted.

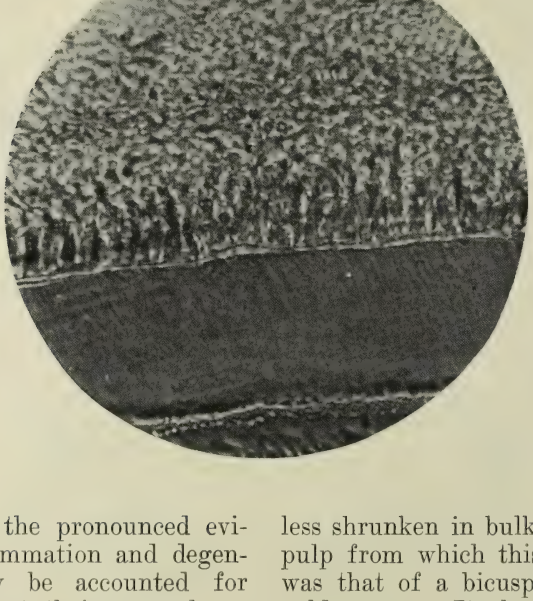
An examination of the pulp (Fig. 13) showed a marked increase in the number as well as the size of the odontoblasts, characteristic of hyperemia and acute inflammatory conditions of the pulp. This increase in the number of creative cells no doubt results from a greater need for a more sustained and higher exercise of their functions, an attempt to shield the more delicate pulp tissue, not by a deposit of secondary dentin, but by creating physiologically a more concentrated area of trophic control. Evidently the pathic disturbance in this pulp was due to the thermal influence of the gold casing upon the terminal branches of

the dentinal fibers, notwithstanding the fact that these were shielded by a layer of normal enamel. Another case, with a history quite similar to the one just described, also showed a marked disturbance of the odontoblastic layer.

Had these teeth been affected with caries, especially of the deep-seated variety, such a disturbance of the odontoblasts would naturally be expected, but being of normal size and without a break in their structure, the pronounced evidence of pulp inflammation and degeneration could only be accounted for through the fact that their normal environments had been interfered with by incasing them in caps of gold with a lining of zinc oxyphosphate. The odontoblasts had not only been numerically increased, but they had become profoundly modified, possessing many new characteristics, all indicative of hyperemia. The nuclei of the individual cells seemed almost to have left the cell body, and the cells themselves presented a broken-down, ragged appearance, denoting the beginning of atrophy.

One of the most probable pathologic effects resulting from the complete incasement of a living tooth by a metallic cap or box such as the modern shell crown, is that of dry gangrene of the pulp. While this condition is most frequently attributed to sudden external shocks, or to strangulation of the apical bloodvessels, similar pathology frequently follows shell crowning. All that seems to be essential to producing a dry gangrene of the pulp is, first, its death, then if bacteria and moisture are excluded the pulp will soon be transformed into a dry, structureless mass, more or less shrunken in bulk. (Fig. 14.) The pulp from which this section was made was that of a bicuspid which carried a gold crown. It showed every evidence both macroscopically and microscopically of dry gangrene. The pulp-cells proper have become multiplied to such an extent and their characteristics so modified that there is little evidence of true pulp tissue remaining. This tooth was without an antagonist, and no history of a traumatic nature could be associated with it. The conclusion, therefore, is that the condition in the pulp cavity resulted from the presence of the gold crown.

FIG. 14.



An examination of the same pulp about midway between the crown and the root-apex showed a wonderful multiplication of cellular elements, with al-

most complete destruction of intercellular substance, the tissue being almost solidified.

Of all the pathic conditions which may follow the boxing in of vital teeth, there are none so likely to occur as pathologic pigmentation. Two specimens of such an effect are here shown. The first one (Fig. 15) shows dentin thus pigmented through the presence of a gold lug which had been attached to the surface by a post implanted in the tissue, and the second (Fig. 16) shows a section through the enamel of a crown which had been

Fig. 15.

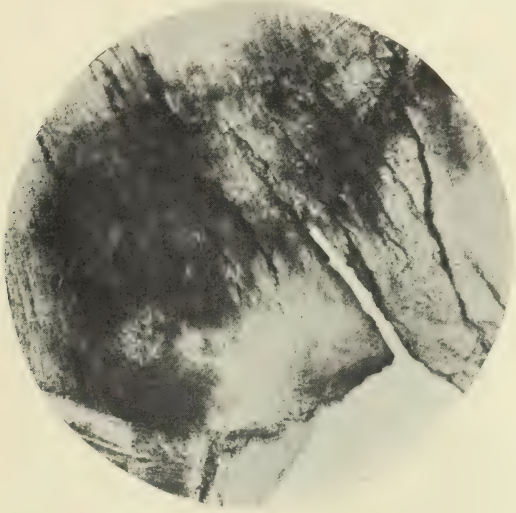
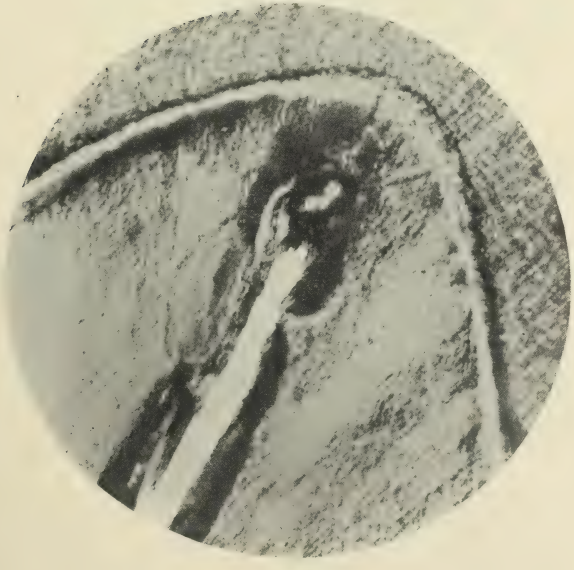


Fig. 16.



used as a means of attachment by a similar method. While it may be argued that such pathologic discoloration may possess but little clinical significance, the writer claims it to be the first step toward a general structural breakdown.

Fig. 17.



Fig. 18.



PERIDENTAL AFFECTIONS.

While three classes of pericemental affections are recognized—(1) those which have their origin in the apical spaces, (2) those which begin at the gingival margin, and (3) those beginning between these points—two other important classifications must be admitted, septic and non-septic.

Those which result from carelessly fitted gold bands or caps can only be properly classified as primarily non-septic, and to originate at the gum margin. The resulting effects may to a great ex-

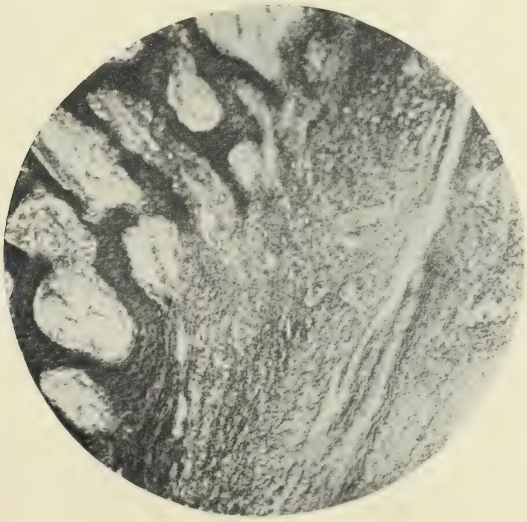
tent be said to be from mechanical causes first affecting the fibers of the dental ligament. While the loss of such teeth through lack of support is usually attributed to abuse or over-use, producing a general hyperemia, and finally, a well-established interstitial gingivitis, in all probability it is largely due principally to a traumatic disturbance of the fibers of the dental ligament. The chief function of this portion of the alveolo-dental membrane being to swing the tooth in its socket, and to right it when slightly turned upon itself through the normal or abnormal forces of mastication, any condition which disturbs its normality places an undue strain upon the principal fibers of the membrane, this being quickly followed by a passive dilatation of the peridental vessels, accompanied by a general breakdown of the tissue.

Fig. 17 shows a decalcified section of the crown of a tooth entirely deprived of its enamel in order to fit the crown. The gingivæ became first hypertrophied, followed by extensive absorption.

Fig. 18 shows the rim of the alveolus with the fibers of the dental ligament as they pass from the gingivæ to the peridental tissue. While under low power these fibers appear to be fairly normal, under higher power (Fig 19) and with proper staining they show marked evidence of degenerative changes. By this time the tooth has become loosened and elongated, and there is evidence of pronounced venous engorgement.

From the very brief study given to this part of the subject it is believed that if the fibers of the dental ligament could be preserved, a great part of the peridental disturbances following crowning would be overcome.

Fig. 19.



While the foregoing disastrous results frequently follow the attachment of large masses of gold to vital teeth with an oxyphosphate cement, they seem much less likely to occur when gutta-percha is employed as the attaching medium. The time allotted for the preparation of this paper was not sufficient to secure any great amount of evidence, but sections were hurriedly made of two such teeth. The history of these teeth is about the same as those referred to in other parts of the paper—gold crowns, teeth lost from lack of support, etc., the only dif-

ference being the use of the gutta-percha. Two sections were made (Figs. 20 and 21) and both of them show pulp tissue quite remarkable for its freedom from pathologic signs.

Fig. 20

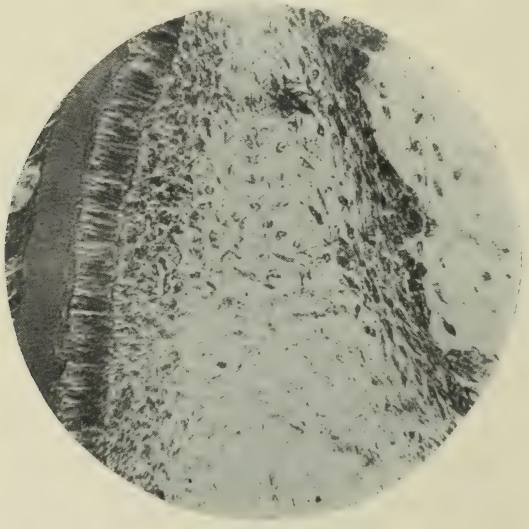
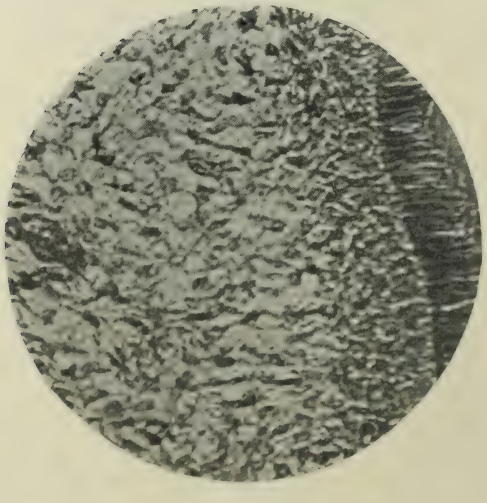


Fig. 21.



DEDUCTIONS.

My deductions therefore are as follows:

(1) That the effect upon the tissues of a vital tooth when partly or entirely incased by large masses of gold is in the majority of instances more or less harmful.

(2) That this is especially so when the terminal branches of the dentinal fibers are exposed.

(3) That there may be a non-carious destruction or disintegration of the enamel in connection with disintegrating cement beneath these masses of gold.

(4) That there will follow in nearly every instance pathology of the pulp, which in turn will result in its death.

(5) That the peridental tissue suffers more from mechanical irritation than from overwork.

(6) That all the foregoing conditions are less likely to occur when gutta-percha is substituted for cement.

THE PROBLEM OF ARTICULATION.*

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Translated by OSCAR T. WAYNE, D.D.S., Zurich.

(Concluded from page 283.)

(IV.)

CHAPTER VIII.—The Forms of Artificial Teeth.

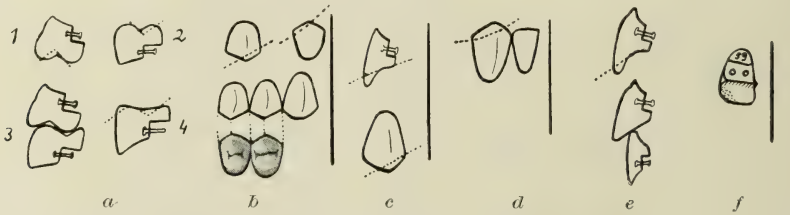
Unfortunately, artificial teeth are not obtainable that correspond to the ideal form demanded by the results of our investigations of the factors governing the same, and we are compelled to grind the masticatory surfaces in order to imitate as far as possible the desired ideal form. The masticatory surfaces of the artificial molars are generally too flat, and their cusps give the impression that they were put on only for the sake of beautifying these surfaces without any regard to their functional requirements. The manufacturers are hardly to blame, because they have been unable to scientifically determine the ideal forms; the dentists themselves have never been able to agree upon the ideal anatomical forms and to unanimously state their wants. Many have demanded molars with longer cusps—and the firm of S. S. White were induced to manufacture them, but these teeth were withdrawn, as there was no demand for them. This is easily explained, as there was no articulator with which all the various masticatory movements could be correctly imitated, and no simple method for measuring these movements in individual cases. Long cusps were therefore more of a hindrance than a help; they served only to displace the artificial dentures during mastication. Most practitioners have been satisfied to use teeth with short cusps, sometimes even grinding away cusps that were already too short so that the dentures would meet flatly in almost any position. Many papers have been written on this subject during the last few years, and especially during the past year, showing that a more intelligent interest is being taken by the profession in this question of cusps, and it is to be hoped that the manufacturers will soon respond to these appeals and will give us new and more correct anatomical tooth-forms. Molars with long cusps shaped according to all the laws derived from our present knowledge of the masticatory movements will greatly increase the masticatory effectiveness of artificial dentures, besides helping to balance them.

The forms of the masticatory surfaces of the artificial molars should be more schematic, as recommended by Bonwill, and the slant of the inner cuspal surfaces should correspond to the opening angles of the four chief types as demonstrated in my molar plates (page 273).

* A translation of Professor Gysi's book, "Beitrag zum Articulationsproblem," published by Hirschwald, Berlin, in 1908, with some practical additions written since its publication.

The masticatory grooves need not be made zigzag, as they are in the natural teeth of adults, but they should be in the proper position, as shown in Fig. 60. With these schematically placed grooves, and with four different opening angles—in other words, four different correspond to the forms of teeth as they are after many years of service—teeth that by use have been automatically shaped to their physiological forms. We are therefore compelled to shape the artificial teeth presented for our use, in the following manner:

FIG. 78.



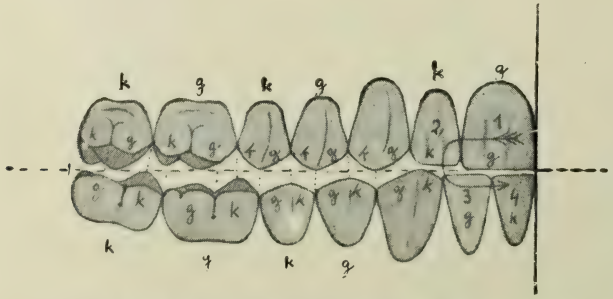
Shows the grinding necessary with the artificial teeth, as at present manufactured.

depths of grooves—it would be a simple matter to shape them by grinding for any special case.

There need be very little change in the form of the bicuspids, as these teeth may be properly shaped with very little trouble. The canines, however, should be

Fig. 78, *a* 1, shows an artificial upper molar, chosen because of its nearness to the proper anatomical form. The dotted line indicates the grinding necessary to produce a correct and effective masticatory surface; *a* 2 shows the lower molar; *a* 4 shows an artificial molar that should

FIG. 79.



Relative sizes of the teeth and their cuspal surfaces.

thicker at the incisal edge, resembling more closely the natural model. These teeth should come from the hands of the manufacturer in such perfect shape that no grinding, or at least very little, should be necessary.

The artificial teeth of the present day correspond fairly well to newly erupted teeth, but for our purpose they should

not be chosen, on account of the thinness of the lingual cuspal surface. A groove would so weaken this tooth that it would be apt to break very easily.

The bicuspids must usually be ground as follows: The mesial cuspal surfaces of the upper and the distal cuspal surfaces of the lower bicuspid should be ground as indicated by the dotted lines

in Fig. 78, *b*, making these surfaces longer and flatter. (See also Fig. 79.) The right bicuspids might well be exchanged for left ones, as the artificial bicuspids have a shape just contrary to that of the natural ones.

the mesial edge so that these teeth are just contrary to the shape of the natural canines in young individuals (Figs. 78, *c*, and 79). The cusps should not be as pointed as those of the bicuspids, representing a gradual transition from the

FIG. 80.

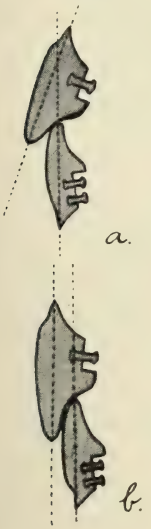
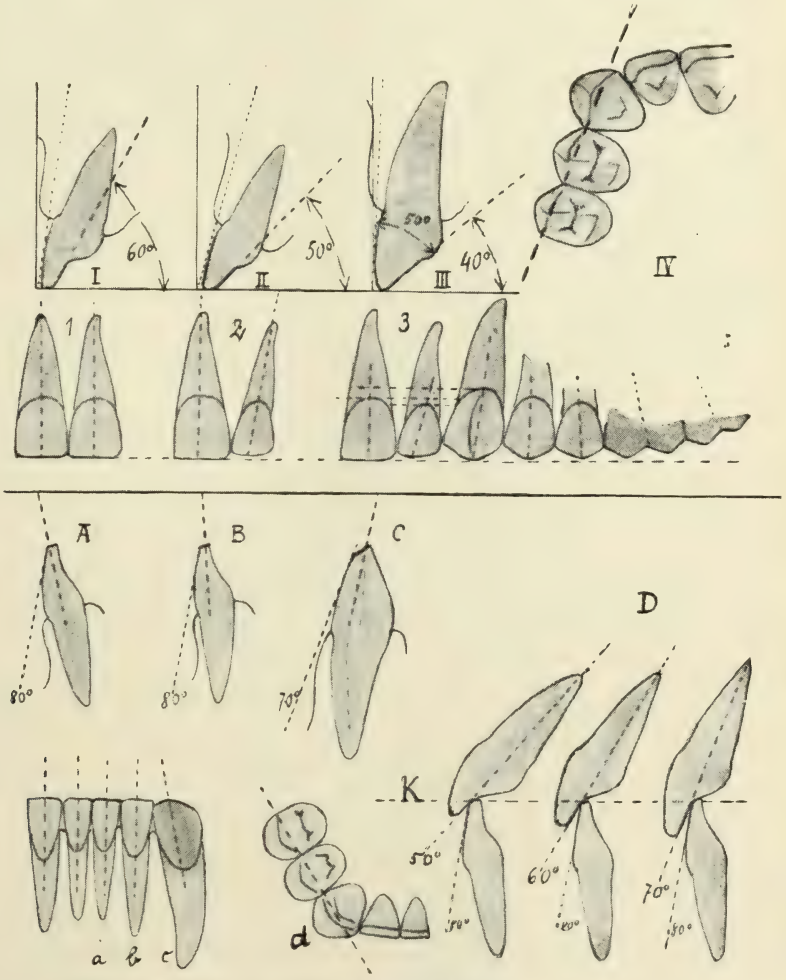


FIG. 81.



[See references on pages 413 and 414.]

Fig. 79 shows the correct relative sizes of the teeth and their cuspal surfaces, *k* signifying smaller and *g* larger in regard to the size of the teeth and their cuspal surfaces.

The upper canines should be ground in the following manner: The incisal edge should be flattened by lengthening

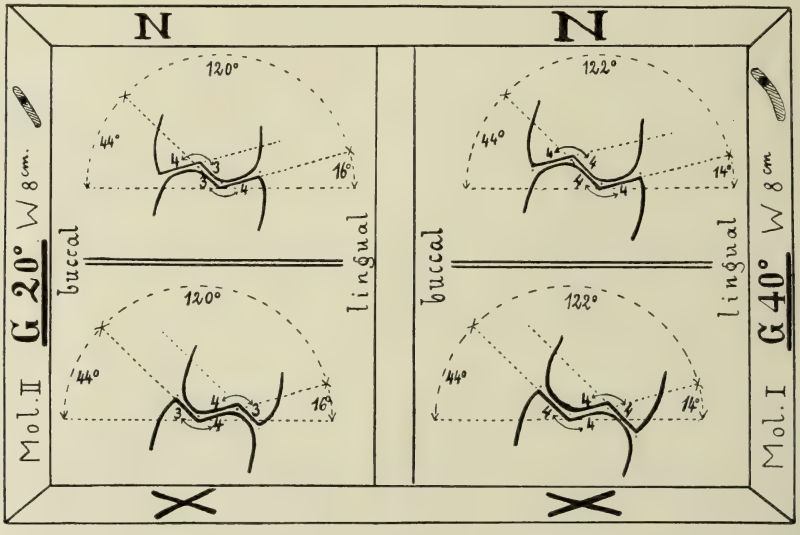
incisors to the bicuspids. The cuspal points should be flattened so that they will look like natural canines after many years of use. (See Figs. 86 and 88.)

The lower canines should be ground thus: The cuspal points should be flattened as in the case of the upper canines, and the mesial edge should be only one-

third as long as the distal edge (see Figs. 78, *d*, and 79), so that during the masticatory movements the upper canine will pass easily through the space between the cuspid and canine. (See Figs. 22 and 79.)

The upper incisors, especially the centrals, unfortunately are usually too small

Fig. 82.



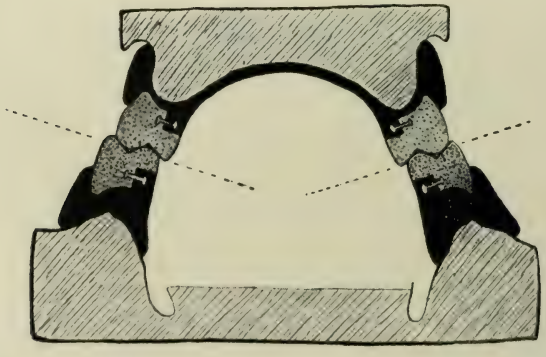
N, Normal occlusion. X, Cross-bite occlusion. G, Condyle path slant. W, Balancing points.

lower bicuspid and the canine. (See Figs. 22 and 86.)

The incisal cutting edge of the lower incisors need not be changed, but it is often necessary to make them narrower, so that the upper canine can pass easily through the space between the lower bi-

(most patients wish to have them that way). They should be of the relative size as shown in 1, 2, 3, 4, Fig. 79.

Fig. 83.

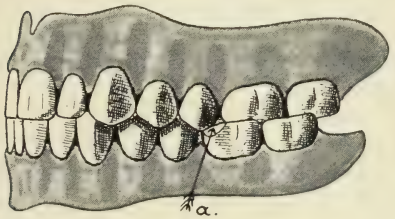


Cross-bite position of the molars in a transverse section.

The incisal edge of the upper incisors should be beveled, as shown in Fig. 78, *e*, and Fig. 80, *a*. This will greatly aid the gliding movements of the lower in-

cisors, and not interfere with the cutting function of these teeth. Fig. 80, *b*, shows a bad position and improper form of the incisors.

Fig. 84.



Side view.

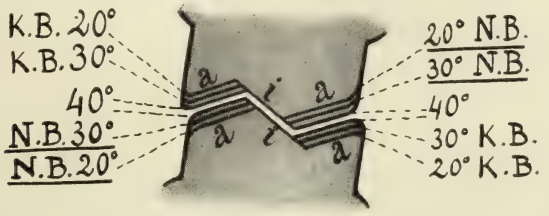
The distal edge of the upper lateral incisors should also be beveled, as shown in Fig. 78, *f*, for the purpose of allowing the mesial edge of the lower canines to pass by freely in lateral movements.

lations of the teeth in the chief movements of the mandible.

Fig. 86 shows the position of the teeth in a left lateral movement with all the teeth remaining in contact. Fig. 89 shows the same position viewed from the back. Both cuspal rows on the left side can be seen in occlusion, also the upper lingual and lower buccal cusps on the right side preserving the occlusion on this side. Fig. 87 is another view of the same dentures in the same position. This picture when viewed in the stereoscope will show all the molars and bicuspids in occlusion. Fig. 88 is another view of the same dentures from the right side. Fig. 90 shows a cross-bite position of occlusion.

Explanation of Fig. 91: As it is impossible for man in all branches of work to perfectly imitate nature, he is forced to copy merely the essential and impor-

Fig. 85.



From experiments I have found all the grinding here described to be necessary in artificial teeth, and I take one tooth after another and prepare them as stated, after which the teeth can be quickly and easily set up in their proper positions. The grinding should be done carefully and thoughtfully and not carried to extremes.

Part II: Some Remarks on the Stereoscope Pictures.*

Figs. 86, 87, 88, 89, and 90 are views of artificial dentures prepared for the stereoscope. These pictures show the re-

tant parts. Art consists in discovering and determining the essential and important features, leaving out all non-essentials. And this holds true with artificial teeth. The reproduction of the essential features in artificial teeth, moreover, is necessary for another reason: The pressing and the vulcanizing of the rubber almost always causes slight changes in the position of the teeth, so that afterward they do not occlude properly, necessitating a certain amount of grinding in the finished pieces. To accomplish this grinding easily and quickly, the masticating surfaces of the molars should have a simple, but correct form.

In Fig. 91, 1 and 1 show the simplest form of a masticatory surface in the mo-

* [Part II of Chapter VIII is an addition to the original German edition of Professor Gysi's book.—Translator.]

lar. This form can be seen in the same figure in O and U, which are models taken from the natural denture of an adult whose teeth have had many years of hard usage. This simple form of masticatory surface I have also determined by experiments as described in Chapter VII; this form would, however, hardly suffice in artificial teeth, as the occlusal surfaces are too broad and plain. This schematic masticatory surface furnishes, however, the foundation of a rational form. It is only necessary to round the upper buccal and the lower lingual cusps as shown in Fig. 57, to secure small occlusal surfaces. (See Fig. 91, II and 2.)

To make the occlusal surface still smaller and to give it a more natural form, a transverse groove may be placed on the buccal cuspal surfaces of the upper molars and on the lingual cuspal surfaces of the lower molars, imitating the sulci of the natural teeth and providing clearance spaces, as also recommended by Turner (DENTAL COSMOS, March 1909). We should stick to this simple form for the reason that, if transverse grooves are made dividing the upper lingual cusps and the lower buccal cusps, a proper occlusion in the lateral movement would be prevented, and the balance of the artificial dentures would be endangered by the cusps catching in these grooves in lateral movements.

Turner (*ibid.*) states that "Black has clearly demonstrated the crushing efficiency of tuberculated surfaces, and Head has published the results of his investigations of the triturating movement of tuberculated surfaces; it is evident, therefore, that an ideal arrangement in which a series of a large number of tubercles fit into fossæ, acting simultaneously, is a most efficient crushing apparatus."

This ideal arrangement we cannot imitate in artificial dentures, as the conditions are vastly different. Artificial dentures must be constructed so that there is no possibility of the cusps catching in any movement, and this is not possible if the upper lingual and lower buccal masticatory surfaces are grooved transversely. The teeth must glide smoothly over each other in lateral movements without danger of any interfering cusp spaces, as we have not the same condition as in firmly rooted natural teeth. With an angular longitudinal groove and a transverse groove on the upper buccal and lower lingual sides provision is made for clearance spaces, as there is no such close occlusion as with rounded grooves. If it is thought necessary for the sake of beautifying the masticatory surface, or of providing additional clearance spaces, a transverse groove can be made in the upper lingual and lower buccal masticatory surfaces, but this groove should not reach the summit of these surfaces, for the reason stated above.

A, B, C, D, Fig. 91, show the schematic forms of the different chief types of grooves derived from Figs. 65 and 66; a, b, c, d, and e show the schematic forms of the masticatory surfaces of the bicuspids: a and b show how this surface is formed on the same principle as a rhomboid dodecahedron (the same form as is shown in bee cells and in many other instances in nature). By rounding the sharp cusps of the fundamental form b (see c and d), we get the natural form e, in which the original dodecahedral form is no longer to be recognized. I have used the intermediary form d in Fig. 92, so that the grinding procedure could be shown more clearly.

In order that the forms of the masticatory surfaces of the teeth of these dentures might be clearly seen, a photograph was taken of plaster models of the same (plaster giving better photographic results than porcelain), and the result is shown in Fig. 92.

I believe that this is the best we can do with the artificial teeth as sold at present, but it is still not the ideal form. The ideal form should be based on this simple form, so that changes could be easily made, as already stated, but additional grooves or fossæ should be made in the ideal artificial tooth to provide additional clearance spaces, and more important still, to secure more of the individual cusp action than we have with natural teeth. These fossæ are too difficult for us to grind, therefore we must wait

FIG. 86.



FIG. 87.

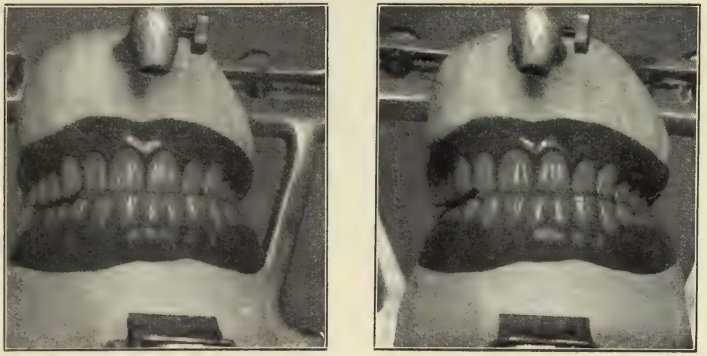


FIG. 88.

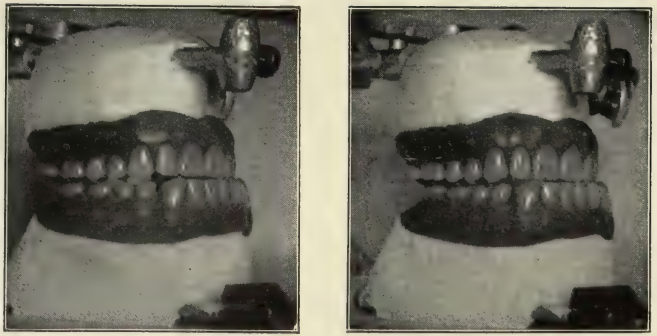


FIG. 89.

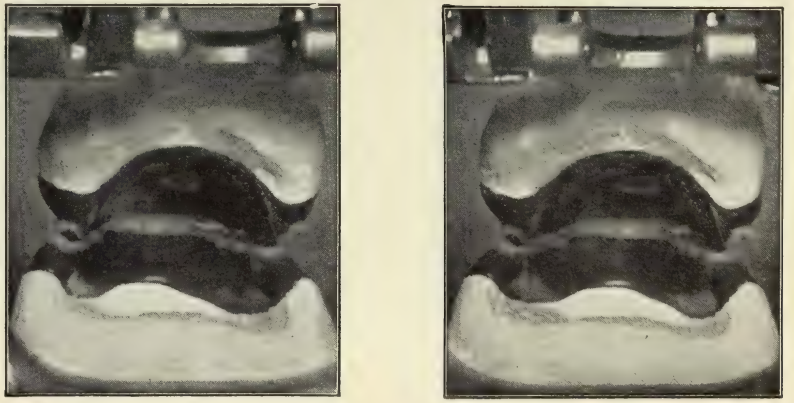


Fig. 90.

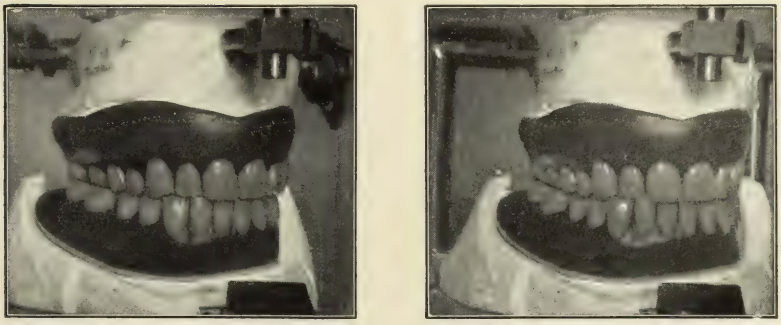


Fig. 91.

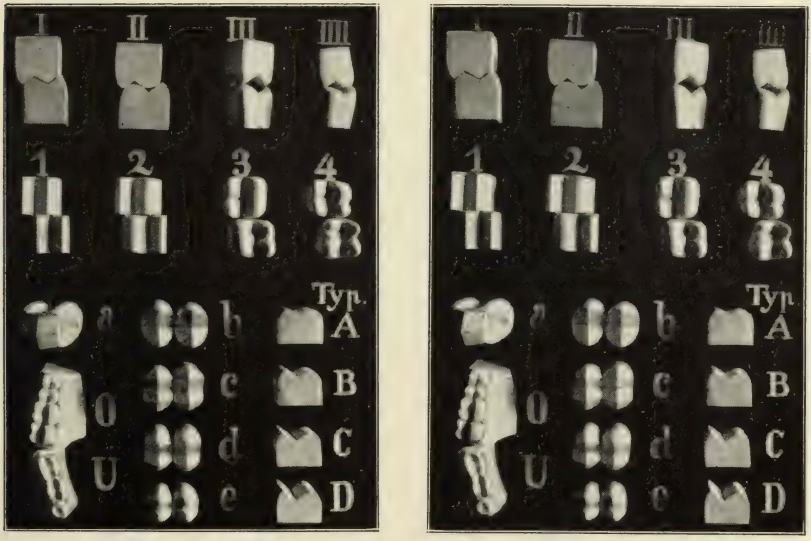
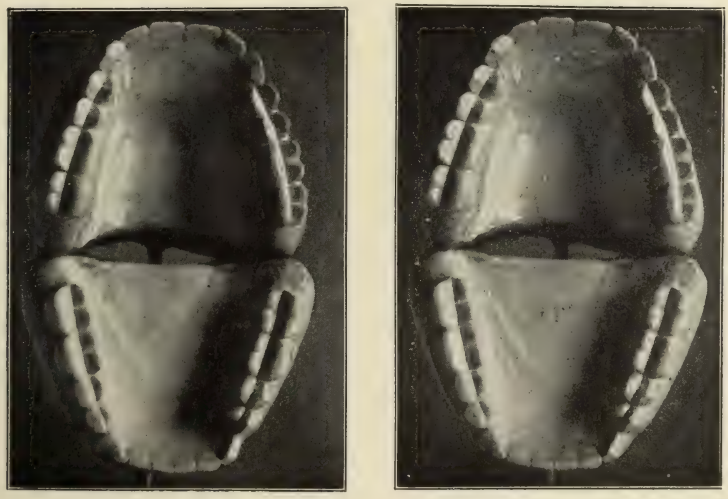


Fig. 92.



patiently until the manufacturer provides us with these ideal teeth.

Fig. 93 is a photograph of a piece of modeling compound which while soft has been placed between an upper and lower artificial denture, the teeth of which on one side (the left) were prepared as advised in the foregoing chapters, and on the other side were prepared so as to represent what I thought would make ideal artificial forms. On the left side the light parts of the picture represent the extensive occlusal surfaces of teeth prepared in the manner shown in Fig. 92.

Fig. 93.



Very good masticatory results are secured with teeth set up properly in an anatomically correct articulator and ground after this method. The food would certainly be properly crushed, but this result is still not satisfactory, as the occlusion is still too extensive, and there is not enough individual cusp action to tear and comminute the food. With teeth having the same fundamental forms but with additional fossæ, as seen on the right side, a better masticatory result is secured. Here the light parts show that the occlusion is not so extensive, and that we have with these forms more of an individual cusp action, with a corresponding improvement in the trituration and comminution of food.

Spence states (*Items of Interest*, August 1907) that if the manufacturers would abandon the thousand-and-one forms on the market, and agree to use only similar and a very few molds, the dentist would be better served. He came to the conclusion that with twelve different molds all needs would be supplied. I think that our needs would be supplied with even less than twelve molds. I am willing at any time to provide any manufacturer with mathematically correct models of four different molds that will supply our wants for most cases and that can be easily altered for any case.

CHAPTER IX.—Positions of the Natural Teeth.

In order that the front teeth may not present a too stiff and regular appearance, standing parallel to each other like the stakes of a garden fence, the positions of the teeth in the natural denture should be studied and copied. The following suggestions may be of service to the practitioner:

(A) *Side view of the upper teeth.*

The labial surface of the upper incisor is slightly inclined, the lower half of its lingual surface is inclined at an average angle of about 60° to the occlusal plane. (Fig. 81, I—page 405.)

The labial surface of the lateral incisor is more steeply inclined; the lower half of its lingual surface has an inclination that is 10° less than that of the central incisor. (Fig. 81, II.)

The labial surface of the canine is almost perpendicular, its lingual surface having an inclination that is 10° less than that of the lateral incisor. (Fig. 81, III.)

The incisal edge of the canine has the same inclination backward as the bicuspids. (Fig. 81, IV.) If this natural law is not observed in the setting up of the artificial teeth, and the incisal edge of the canine is placed more in the direction of the incisal edge of the incisors, the whole appearance of the artificial denture will be spoiled, as the canine with its broad labial surface will give it a broad and unnatural appearance—all

the more so because the bicuspids in following this line make the whole tooth-curve still wider and flatter.

In the placing of the canines in artificial dentures it is important that the cusp point should be on the same level as that formed by the central incisors and bicuspids. (Fig. 79, Fig. 81, 3, and Fig. 70.)

(B) *Front view of the upper teeth.*

The two upper central incisors are parallel to each other and to the median line of the jaw. (Fig. 81, 1.)

The lateral incisor is slightly inclined toward the median line, the incisal edge not quite reaching the level formed by the central incisor, canine, and bicuspid. (Fig. 81, 2.) The canine has but a slight inclination toward the median line. (Fig. 81, 3.)

(C) *Side view of the lower teeth.*

The long axis of the lower central incisor is strongly inclined forward, but its labial surface inclines slightly inward. (Fig. 81, A.) The lateral incisor is more perpendicular. (Fig. 81, B.) The canine is either perpendicular or has a slight lingual inclination. (Fig. 81, C.) The lower incisors have normally always the same inclination, while the upper incisors have inclinations which may vary from 50° to 70°. (Fig. 81, D.) But for practical purposes, as stated in another chapter, it is better to shape this surface so that there is only an inclination of about 40°.

(D) *Front view of the lower teeth.*

All four lower incisors are parallel to each other. (Fig. 81, *a, b.*) The lower canine inclines strongly toward the median line (Fig. 81, *c*), with its incisal edge inclining in the direction of the bicuspids. (Fig. 81, *d.*)

The front teeth can be arranged to best advantage while the patient has the wax denture in the mouth for trial, as in the articulator we have only lines of direction to go by. With the patient in front of us, the teeth can be placed with due regard to the lines of the lips, nose, eyes, etc.

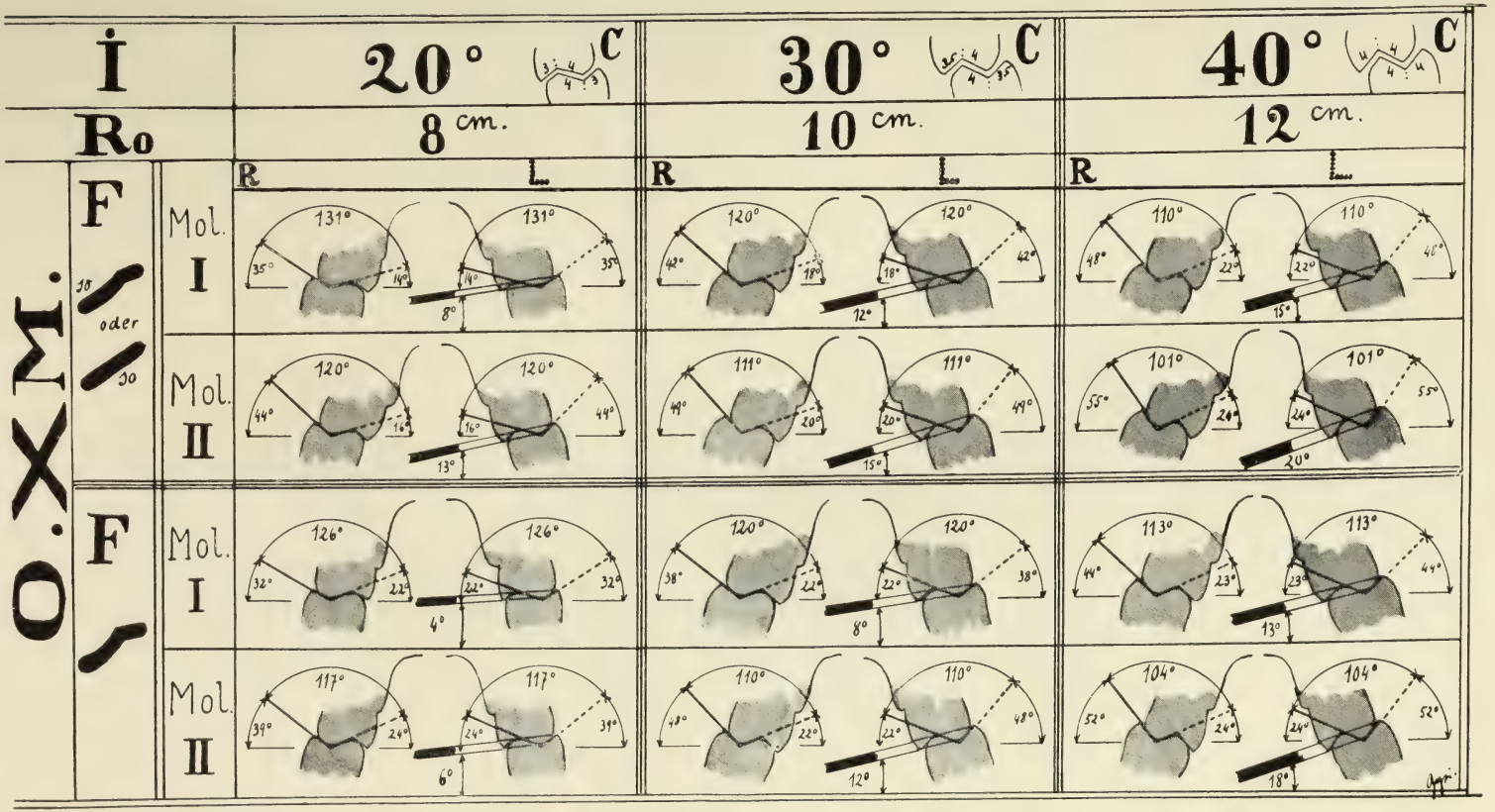
To relieve the monotony of the color shade, the lateral incisors may be selected a little grayer, and the canines a little yellower, than the central incisors.

CHAPTER X.—The Cross Bite.

Eugene Müller of Zurich determined from exact measurements of edentulous jaws that the resorption of the upper alveolar ridge is greater on the buccal side than on the lingual side, and that the opposite is the case in the lower jaw, the lingual side of the lower alveolar ridge being much weaker than the compact buccal side. Before extraction the upper arch is 5 mm. wider than the lower, measured from the outer edges of the masticatory surfaces of the teeth. Measured from the alveolar ridges, before any resorption takes place, both arches are of about the same size, the buccal inclination of the upper teeth and the lingual inclination of the lower ones allowing the upper teeth to occlude outside of the lower.

Müller therefore advises the use of the so-called "cross bite" in the molars in the construction of dentures (see Fig. 83—page 406), whereby the buccal surfaces of the lower molars are made to occlude outside of the same surfaces of the upper molars. The dentures balance better this way, as it is not necessary to place the upper molars too far over the alveolar ridge. All the other teeth should occupy their proper anatomical positions. (See Figs. 84 and 90.)

There are cases in which it is necessary to make use of the cross bite on one side only, and others in which it is only necessary to place the second molars in this position. If one endeavors to follow the rule for placing the teeth directly over the alveolar ridge, the necessity for making use of the cross bite is made very evident. Care should be taken that the teeth should not meet edge to edge in endeavoring to make the change a gradual one from the normal position of oc-


I
20° C
30° C
40° C
Ro
8 cm.
10 cm.
12 cm.
O.X.M.
F
30 oder 30
F
R
L
Mol. I
Mol. II
131° 131° 35° 35° 14° 14° 8°
120° 120° 44° 44° 16° 16° 13°
126° 126° 32° 32° 22° 22° 4°
117° 117° 39° 39° 24° 24° 6°
120° 120° 42° 42° 18° 18° 12°
111° 111° 49° 49° 20° 20° 15°
120° 120° 38° 38° 22° 22° 8°
110° 110° 48° 48° 22° 22° 12°
110° 110° 48° 40° 22° 22° 15°
101° 101° 55° 55° 24° 24° 20°
113° 113° 44° 44° 23° 23° 13°
104° 104° 52° 52° 24° 24° 18°

clusion to the cross-bite position, as this may result in the cheek being caught between these edges in biting. To prevent this the mesial edge of the buccal cusp of the lower first molar should be ground as shown in Fig. 84 at *a*, so that the distal edge of the upper second bicuspid will overlap the above-named part of the lower molar.

With the aid of my apparatus for determining the slant of the masticatory cuspal surfaces (see Fig. 62), I have prepared the table shown in Fig. 82 for comparing the relative lengths of buccal and lingual cuspal surfaces in normal and in cross-bite occlusion.

With a condyle path slant of 40°, when all the cuspal surfaces are of the same length (after the law derived from Fig. 63), the lower left molars may simply be exchanged for the upper right molars, and *vice versa*, provided that some of the later models of artificial teeth now manufactured are used, these being the most suitable for this kind of work. The teeth may be changed on the wax plate as received from the hands of the manufacturer.

With a condyle path slant of 30° and 20° when the cuspal surfaces are not of the same length (see Fig. 63) it will be necessary to have just the opposite surface relations. The larger cuspal surfaces that lie on the buccal side in normal occlusion will thus lie on the lingual side in the cross bite. (Fig. 87, left.) In these cases a simple changing of the molars will not suffice, if accuracy is desired.

If the practitioner wishes to be more exact, the groove may be ground after the schematic drawing of Fig. 85, but this method of grinding is so difficult that it may be truly said that it possesses only theoretical value.

The schematic molar is for a condyle path of 40°, which according to the law derived from Fig. 63 has cuspal surfaces of equal length. For a condyle path with a slant of 30° this molar must be ground to line 30° N.B. for normal occlusion, and to the line 30° K.B. for cross bite, etc.

For normal occlusion the corresponding outer surface, *a*, is therefore ground so that the inner surface, *i*, is made shorter, and for the cross bite so that the inner surface, *i*, is made longer. After this preparation the lower left molar can be exchanged for the upper right molar for the cross bite, and thus we have the necessary surface relations as shown in Fig. 82.

In the accompanying molar plate I have prepared some masticatory surface forms for use in cross-bite work. The opening angles are the same as for normal occlusion. With the help of these forms and the laws derived from Fig. 67, the proper masticatory surface relations can be determined for right and left sides that are unlike. This plate also shows that the inclination of the molars is at an angle that is from 4° to 6° greater than in cases of normal occlusion. (See plate IV, cross-bite molar plate, on preceding page.)

CHAPTER XI.—Regulating the Speech.

Very often patients find it difficult to pronounce certain words. These words usually contain the letters s and z. This can easily be corrected while trying-in the dentures, providing that the wax plates are prepared in the shapes which they are expected to have in the finished dentures. Have the patient recite some prepared lines containing a number of these sounds, for example: "Peace satisfieth the soul," and "Zeal brings happiness." If the patient finds it difficult to pronounce these words, add a thin layer of wax on the upper denture back of the incisors. If this results in an improvement, add more wax until the enunciation is satisfactory. If the adding of the wax makes it more difficult for the patient to enunciate properly, this can be remedied by making the denture thinner back of the incisors and canines.

CHAPTER XII.—Grinding Inaccurately Fitting Dentures.

It often happens that artificial dentures that occlude properly in the articu-

lator and while being tried in the mouth do not occlude properly when they are finished, owing to slight changes in the position of the teeth caused by the rubber-press and vulcanizing. In these cases it is necessary to do a certain amount of grinding to perfect the occlusion. This is usually done with so-called articulating paper, and usually the mistake is made of grinding away all points marked by this paper without regard to the function of these portions, and in this manner a good occlusion is often spoiled. In this work two rules should be observed:

(1) Points marked in normal occlusion may be ground away on both upper and lower dentures, but if it be a cusp point the groove should at the same time be deepened so that the masticatory surface may not become too flat and the use of the important compensating cusps be lost.

(2) Points marked during lateral movements should only be ground that are not in occlusion in the resting position—that is to say, points that are in occlusion only in the lateral movements. These portions are the buccal cusps of the upper teeth and the lingual cusps of the lower teeth. In the crossbite position the opposite is the case.

Closing Remarks.

In the construction of artificial dentures three grades of functional efficiency can be obtained.

First. When the dentures are set up in a plain hinge-joint articulator. Here no lateral movements are possible, as such movements would displace the dentures, and the food is only crushed and not comminuted.

Second. When the teeth are set up in a modern joint articulator allowing lateral movements and teeth are used such as are supplied by the manufacturer without any preparation in the shape of masticatory surface grinding. In these cases lateral movements are possible, but there is occlusion only in three or four places. This may prevent displacement of the dentures, but mastication is far from being perfect.

Third. When the teeth are set up with proper attention being given to all the rules and laws derived from a knowledge of all the movements of the mandible. Only in this case is it possible for the wearer of artificial dentures to carry out all natural masticatory movements and have all the teeth come into proper occlusion, whereby the dentures are better balanced, and foods and even tough meats can be properly masticated.

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DENTAL SKIAGRAPHY.

By HERBERT McINTOSH, A.M., M.D., Boston, Mass.

THE following cases are so instructive and so well illustrate the great value which dental skiagraphy possesses for the clearing-up of difficulties of diagnosis that they deserve to be reported:

Case 1. Miss F. D. O., eighteen years of age, had suffered for several weeks with a severe facial neuralgia in the region of the right lower jaw. A dental skiagraph, of which Fig. 1 is a reproduction, revealed a submerged third molar impacted against the molar in front. A curious condition exists here, since it was claimed that the molar against which it was impacted is the first molar, the second molar having been extracted some years previously. Whether this is an error, and the molar which had been extracted was the first molar, there appears to be no present method of determining. It is certain, however, that there were but two molars in the alveoli at the time the skiagraph was taken. Extraction gave

immediate relief. This case was referred to the author by Dr. H. C. Spencer of Newton, Mass.

Case 2. Mr. S. C., twenty-three years of age, had long suffered with facial neuralgia, and had had three teeth devitalized without relief. The accompanying picture (Fig. 2) displays a submerged and impacted third molar in the right lower jaw, the extraction of which gave immediate relief. The case was referred to the author by Dr. I. Lett, Boston.

Fig. 1.



Fig. 2.



Case 3. Mr. F. B. C., forty-five years of age. This patient said he had had a third molar extracted from the right lower jaw two years ago. Thereafter he had suffered from inflammation of the tissues, resulting in tonic spasm of the facial muscles, which prevented him from opening his mouth for a period of ten days. After long-continued poulticing an abscess opened through the cheek. Following this all the teeth in the lower jaw were extracted upon that side. Since then he has had a continuous discharge in the mouth from the posterior portion of the mandible on the same side. The skiagraph shown in Fig. 3 displays a tooth beneath the gum which is firmly implanted in the ramus of the jaw. The doubt in this case originated from the fact that according to the story of the patient, his third molar had been extracted. The probability is that it had been broken off, since the axis is such that a dentist in attempting to extract it without knowing its line of direction would almost infallibly have broken it.

Fig. 3.

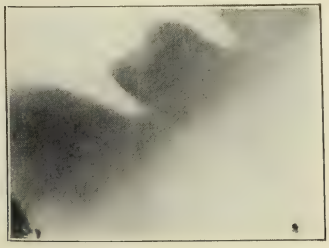
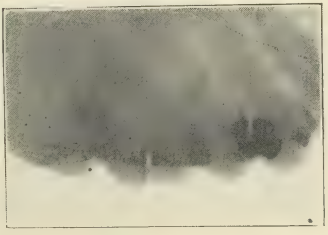


Fig. 4.



Until the skiagraph revealed the true condition, the cause of the continued discharge could have been attributed to sarcoma, sequestrum, denudation of the periosteum, or perhaps any one of several other conditions. This case was referred to the author by Dr. Ross Vroom, Boston.

Case 4. Dr. H. M. This is a second bicuspid in the left upper jaw, which had

been filled some two years ago. Thereafter, as it gave trouble, the filling was removed and the pulp destroyed; the root-canal was cleaned out, so it was supposed at least, and filled with gutta-percha. The tooth has, however, been sensitive and "grumbling" ever since. This most interesting skiagraph, Fig. 4, reveals the cause of the trouble. The gutta-percha point has not penetrated the root-canal more than one-third of its length, has then curled up, and has left the rest of the canal unfilled. It is not surprising that the tooth is troublesome. The indication is of course to remove the imperfect root-filling and make a fresh attempt to carry a filling to the apical foramen.

It is becoming increasingly evident from day to day that much trouble with teeth is due to failure to reach the end of the root-canal so as to abolish dead spaces; and the great service which dental skiagraphy is capable of rendering to the profession by revealing these failures is also daily becoming more apparent.

ON DENTAL CARIES.

By LEUMAN M. WAUGH, D.D.S., Buffalo, N. Y.

(Read at the union meeting of the Seventh and Eighth District (N. Y.) Dental Societies, October 29, 1909.)

AT the present time, when the brightest minds in medicine are devoting their best energies toward the discovery of means for the prevention of disease, it seems opportune that we pause at intervals to consider what is being done toward this end in our special field. As one short paper will not permit a consideration of all branches of dentistry, we shall confine our effort to dental caries.

This is the most common and the most constant disease to which human flesh is heir; the treatment of its ravages constitutes the greater part of the dentist's labors. It has existed in all ages and among all known races, both civilized and savage. In the British Museum, London, is the skull of a mummy, dating 2800 B.C., exhibiting well-marked caries, and in various collections in all civilized countries are innumerable skulls showing the results of tooth-decay which in the light of careful examination shows no important difference from that which exists today. In the recently published "History of Dentistry" by Guerini, page 21, we are told that in a collection of Egyptian writings dating with reasonable certainty as early as 1550 B.C.—parts of which quite probably have their origin in a far more remote epoch—are prescribed a number of remedies for dental caries and its sequelæ. On pages 25, 26, and 27 of the same work we learn that about 500 B.C. medicine in Egypt was regulated, its practitioners being divided as exclusive specialists, some of whom were doctors for the teeth; that dental art had then made remarkable progress, and that both filled and artificial teeth have been found in the mouths of mummies. The following chapters in that book record dental procedures among the Hebrews, Chinese, different primitive peoples, the Greeks, Etruscans, Romans, Arabians, followed by a review of the progress made in the successive centuries up to our time.

In the early part of the eighteenth century a noted German surgeon wrote a dissertation on toothache and other dental affections, and advised the filling of superficial cavities by removing the

decayed tooth-structure and stopping the openings with white wax, mastic, lead, or gold leaf. This was followed by valuable observations and suggestions by others. Much progress continued in the treatment and replacement of teeth, but up to 1776 A.D. there was no recorded effort to determine the etiology of dental caries. About that time dental literature records the first attempt at explaining its cause. It was thought to be an inflammation or gangrene of tooth-structure, having its inception in the surface cells of the dental pulp, the dentin consequently being broken down, this being followed lastly by a destruction of the enamel. This theory prevailed until about seventy-five years ago. In 1835 Robertson advanced an opinion, based upon observation, that tooth-decay was the result of chemic decomposition, and that inflammation had nothing whatever to do with the process.

In 1867 the electric theory was promulgated, it being claimed that acids would emanate from the positive pole, the crown, and cause chemic decomposition. The electric theory found but few advocates, the chemical one at that time fast gaining increasing support. The origin and character of the acid, however, were as yet problematic, some believing that in the putrefaction of food in the mouth, free sulfuric, nitric, and hydrochloric acids were generated.

In 1867 Lieber and Rottenstein made an important advance in that they proved the presence of bacteria in the tubuli of carious dentin, and called attention to the probable association of bacteria with dental caries.

A great deal of speculation, much observation, and some scientific research intervened until 1882, when Miller announced the results of his experiments, which have held ever since.

He demonstrated conclusively that dental caries occurs as a direct result of bacterial action, and that a great many of the mouth bacteria produce acid fermentation of carbohydrate foodstuffs. Black, working in this field about the same time, called attention to the additional fact that the acid must have direct action upon the tooth-structure, and being in a nascent state, is capable of causing decalcification. This is followed by liquefaction of the remaining organic portion. This contradicted the inflammation or vital theory, which had the carious process beginning *within* the tooth, and the electric, which involved both external and internal conditions, and proved that the initial lesion is due to *external* influences. The causes of dental caries may be classed as (1) exciting and (2) predisposing.

(1) *Exciting causes of caries.* The exciting cause is the acid produced by the action of micro-organisms at the point attacked. The mouth, being an ideal incubator and furnishing all kinds of food, the proper temperature, and the necessary moisture, constantly contains a great many varieties of bacteria. No matter what may yet be learned about the predisposing causes, the essential consideration must always be one of bacteriology.

(2) *Predisposing causes.* The predisposing causes may be subdivided into (a) local and (b) general.

(a) *Local predisposing causes.* The local predisposing causes are primarily tooth imperfections, which afford favorable lodging-places for bacterial growth. These are faults of form and arrangement of the teeth, such as fissures, deep pits, and sulci, flat approximal contact surfaces, and teeth out of proper position. These conditions simply tend to prevent proper cleansing, and therefore favor the lodgment of food and the action of bacteria.

There are some other local predisposing causes, such as acid medicines improperly administered, also the acid vomitus of pregnancy and seasickness. These seem to cause a roughness of the enamel, which favors the attachment of the micro-organisms, and thus invites caries. Acid secretion of the gum may act in the same way.

Insufficient mastication will lessen the friction necessary for the cleansing of the teeth and health of the gums. In certain catarrhal conditions of the oral mucous membrane the saliva becomes

mucinous and ropy, and entangles particles of food, aiding them in their adherence to the teeth. Many cavities of decay have a like result.

Colloid degeneracy of the tonsils is believed by Low, after much careful observation, to result in a glutin constituent entering the saliva, this also producing a sticky quality.

(b) *General predisposing causes.* The general predisposing causes may be divided into—Heredity. Pre-natal and post-natal influences. Age. Bodily conditions.

The facts that caries is much more prevalent in some mouths than in others, and that there are periods of comparative immunity and marked susceptibility have led to much speculation as to the cause.

Formerly, it was generally thought that so-called hard and soft tooth-structure was primarily responsible for periods of slow and rapid progress. Dr. Black, in 1893, made known the results of analyses of "hard" and "soft" teeth which led him to the opinion that hardness and softness have nothing to do with the inception of caries. Clinical observation would seem to bear this out. It is noticeable in mouths with teeth having enamel of poor texture and yielding easily to the chisel, that but little decay is present, and again that in mouths containing teeth with dense enamel there is evidence of much caries.

These facts led Black to the conclusion that a period of marked tooth-decay is due to either a temporary lack of oral hygiene, the exciting cause, bacteria, being active, or to some systemic condition which so changes the constitution of the oral fluids as to favor the formation of microbic plaques.

It will here be noticed that in either case the problem is a bacteriologic one. The micro-organisms, to cause decalcification, must be in contact with the tooth, and pour their acid by-product directly on its surface. For this there must be some means by which the micro-organisms can be retained in contact with the tooth-surfaces, especially if these be smooth. The bacteria, under conditions which interfere with or restrain their growth, form a substance commonly spoken of as gelatinoid; invested with this substance they attach themselves to the tooth-surface. This mass is termed the microbic plaque.

If the tooth is kept clean and free from bacteria, dental caries cannot exist. These facts, when first discovered, gave an enormous impetus to preventive dentistry. This by-product being an acid, it was at first thought that antacid mouth-washes would largely limit, if not control the disease. This, however, proved of little value, as it was soon shown that acid will appear in the mouth twenty minutes after a meal, and after the mouth fluid has been neutralized by a saturated solution of sodium bicarbonate.

The germicides, disinfectants, and antiseptics were also enthusiastically employed and great varieties of so-called mouth-washes were soon foisted upon the profession, but they, too, have proved inadequate, as any agent sufficiently strong to sterilize the mouth would result in serious injury to the soft tissues. Innumerable agents have been tried, with the happy result that today dentistry has one means of local treatment by which the inception and progress of the disease may be quite well controlled in a majority of mouths, together with a narrowing of the field of scientific investigation, which promises eventually to provide a working knowledge by which it will be possible to determine what pathologic states of the saliva favor the progress of caries. Once this is made out, the selection of suitable remedial agents should be comparatively easy.

The local means of preventive treatment to which reference has just been made is the prophylaxis method first suggested to the profession by D. D. Smith, and now practiced with gratifying success by dentists everywhere. Modifications have been made by different devotees, but the basal technique remains the same; as far as the tooth-surface is concerned it is a purely mechanical process, in fact just as much so as the removal of varnish from wood by fine abra-

sives and friction. As all practitioners are familiar with this process, a review is unnecessary.

The second means for limiting caries takes us into a field as yet but little explored. In the main it consists in a consideration of the constitution of the saliva, with special reference to its influence on the formation of the microbic plaque.

In 1904, Dr. Low, then chairman of the Scientific Research Committee, New York State Dental Society, decided to investigate the saliva. His first effort was directed toward discovering morbid constituents which might aid the carious process. After considerable work had been done with specimens of vitiated saliva, with but very little progress, it was decided to study the saliva in healthy mouths. After much work along various lines it was found that potassium sulfocyanid was almost constant in samples from mouths having but little caries, and further, that it was absent in a very large percentage of mouths having much tooth-decay.

This led to an investigation of the therapeutic properties of certain forms of sulfocyanate, and finding that it was administered in general systemic conditions which are frequently associated with periods of rapid tooth-decay, and that no harm would follow its administration, it was decided to study the result of giving it by the stomach. In subjects having no proving, the saliva was found to contain traces in a remarkably short time, the quickest being forty-five minutes. Further investigation seemed to substantiate this, and the following year, under the auspices of the Committee on Research and the Correspondent of the New York State Dental Society, test charts in colors were prepared, containing instructions for making tests for the presence and the percentage of potassium sulfocyanid, with reference to the condition of the teeth as regards caries. These were widely circulated in America, and some were sent to dentists abroad, with the urgent request that tests be made. In the Correspondent's report of the following year, it was found from the charts returned that the belief of the committee was sufficiently supported to warrant further investigation.

The potassium sulfocyanate was at first prepared in the form of a syrup, but through the efforts of the committee it was soon procurable in tablets of one-half grain, from Parke, Davis, & Co. These have been prescribed by a few friends of the movement, with seemingly gratifying results. The dosage is one tablet of one-half grain sodium sulfocyanate given daily until the saliva gives a good proving. This may take from one to three or possibly four weeks; the treatment is then discontinued until, on test, the proving is again poor. This may extend over a period of from a week to several months, and in a few cases to over a year. When the proving again becomes poor, more of the tablets are taken, until the consistence of the saliva is raised to about standard.

No matter what our future study may bring to light, either in local or general predisposing causes, the essential problem must ever be one of the microbic plaque. Consequently, the Committee on Scientific Research has during the last two years continued to study this problem from the bacteriologic aspect, and while it is impossible as yet to make positive statements, the facts so far seem to substantiate the theories of the former committee, of which Dr. Low was chairman.

The writer has recently heard it said that the seeming lack of means for the prevention of tooth-decay stands as a contradiction to our claims of scientific progress in dentistry. In consideration of the fact that the *cause* of dental caries has been known for only twenty-seven years, of the many and radical changes in medical practice because of newer knowledge in bacteriology, of the painstaking investigations being carried on by dentists everywhere, and primarily, in consideration of the excellent advance made in the prevention of the disease, the writer believes that in place of reproach, dentistry is worthy of encouragement and congratulation.

PHOSPHOR-NECROSIS.*

By DR. LUIGI ARNONE, Florence, Italy.

TOWARD the end of 1834, Germany celebrated a great event—the invention of lucifer matches (*Schwefelfaden-Streichhölzer*). This discovery, which did away once and for all with the old lock-and-flint systems of striking a light, was hailed with enthusiasm by the people of that country. It marked in fact a great step forward in chemistry, which was still in its infancy, an outcome of the old alchemists' retorts, and was commencing to cast the first rays of light on human knowledge.

A few years later, in 1845, Lorinzer first made a communication to Viennese medical men describing a new disease that he had noticed among match-workers, especially those who were handling phosphorus for many hours a day.

Almost at the same time, Strohl in Strassburg, Dietz in Nürnberg, and Blumhas in Stuttgart made the same observations. A few years later, in France, Roussel and Sédillot presented at congresses and scientific meetings the results of their observations on this disease. In France, "necrosis phosphorica" was an object of study for many experimenters, among whom were Trélat, Verneuil, and Jagu. Even the great Magitot devoted himself to the study of phosphorus poisoning.

Authors vary in their determination of the time which must elapse between the beginning of phosphorus handling and the first appearance of osteitis; this is natural when we take into consideration that the natural predisposition, the greater or less individual resistance, is an important factor with regard to the exciting cause.

As a general rule, about five years elapse before a workman is attacked, but cases are on record of its onset after five months' handling of phosphorus; while in other cases eighteen years have elapsed before manifestations were noticed. I am satisfied, after investigations conducted in several factories, that eighteen months is sufficient for the development of this disease. Let us here note that the young show a greater predisposition to it than older persons, and that women are more liable to it than men; especially is this the case with women in pregnancy.

For us dentists the paramount interest lies in the fact, which has been remarked by the greater number of authors, that the possession of sound teeth, or the careful preservation of these organs, confers a certain immunity, and is a safeguard in favor of the workman in his battle against this chronic phosphorus poisoning; tooth-decay, if advanced to the third degree, or deep-seated caries, offers a dangerous inlet, and is a predisposing factor in the disease.

According to Riedel's researches we are aware that other bones, especially in the extremities, are sometimes attacked by this form of necrosis; but such cases one might call exceptions, and the progress of necrosis in them is different, since the bones soften as in simple osteitis; in the bony structures about the mouth, on the contrary, suppuration assumes a malignant character.

Some authors, led by Dubois, hold that phosphorus poisoning is brought on exclusively by white phosphorus. I consider it more correct to say that white phosphorus is more poisonous than the red or amorphous variety. The latter

* Translated from *La Stomatologia*, Milan, Italy, vol. viii, No. 3.

is obtained by subjecting white phosphorus to the direct rays of the sun or heating it in some inert gas to a temperature of from 235° to 250° C. Its specific weight at a temperature of 10° C. reaches 2.16, while that of white phosphorus is 1.83; besides, it loses its luminosity in the dark and does not oxidize when exposed to the air. If, however, it be heated to 280°, it becomes again ordinary white phosphorus.

The lesion which characterizes the pathological process under discussion is an osteo-periostitis, with necrosis localized on the maxillaries, prevalently on the mandible.

To explain this prevalence many conjectures have been made, many theories advanced; we may class them, however, under two heads: Some admit the direct action of phosphorus vapors on the gums and on the bones of the mouth (Strohl, Dupasquier, Magitot). Others maintain that the phosphorus poisons the whole body, which suffers in one particular part of the osseous system from this harmful action (Sorniser, Wegner, Adam).

How do the latter explain the special local effects? and how do the former account for the systemic action?

The paste in the match-heads contains about 10 per cent. of white phosphorus,* which, being kept in fusion at a moderate temperature, evolves vapors which in contact with the oxygen in the atmosphere produce phosphoric acid, and this irritant vapor, coming in contact with the buccal mucous membranes and dissolving in the saliva, produces primitive gingivitis, and consequently periostitis and osteitis. (Desprès admits that the local action upon mucous membranes and oral bones depends upon the elimination of phosphorus through the saliva —an elimination noticed with other substances.)

The advocates of the systemic poisoning theory, and of maxillary necrosis as a secondary phenomenon, maintain that the whole system when invaded by phosphorus is altered, and base this view upon clinical facts and laboratory experiments.

Wegner and Kanowitz noticed in a match-worker, and afterward in poisoned animals, that the periosteum has less adhesion with the subjacent bone than normally, and that the superficial osseous layers show rarefactions, eburnifications, and other unmistakable signs of altered vitality or abnormal activity.

For my own part, I would not exclude one theory or the other, since general infection is always present in phosphor-necrosis, and some cases are recorded—most exceptional ones, it must be admitted—in persons who never had any contact with the vapors of phosphorus. Thus Hutchinson publishes a case of phosphor-necrosis in a woman who, in the course of three days, had swallowed three milligrams (half a grain) of phosphorus. How can such a case be explained by the theories of Bibra and Gleist? and how can one explain on these lines the cases of other individuals affected by phosphor-necrosis in whom the mouth was, notwithstanding, perfectly healthy?

We may remark that daily observations and experiments prove that the saliva always dissolves phosphorus vapors, and saliva thus acidified dissolves cementum and dentin, facilitating the spreading of decay.

The workmen who are most exposed are those who manipulate the paste. I have seen some of them working up the paste with the left hand while the right hand held the piece of bread which they were munching and chewing with the greatest unconcern, almost as if the breathing of phosphorus vapors were not sufficient and they wished to swallow it!

Phosphor-necrosis usually attacks the mandible, yet often both jaws at the same time; it spreads from the alveoli to the osseous mass, producing fistulous sinuses and large lacunæ. The anatomical progression of the disease is the ordinary course of all necroses which attack the osseous system, viz:

* The paste used on matches in factories is the following: Phosphorus 8 parts, glue 21 parts, lead peroxid 24 parts, saltpeter 24 parts. The glue gives cohesion, and the two last-named substances furnish the oxygen necessary for combustion. (Marco.)

First period. Periostitis with proliferation in the stratum contiguous to the bone, and consequent rarefaction and formation of lacunæ in the superficial osseous layers.

Second period. As a result, rarefaction in the osseous substance and dilatation of Haversian canals, medullary proliferation, and at the same time thrombosis and occlusion of nutritive bloodvessels of the bone, are noted.

Fig. 1.



Phosphor-necrosis. (From Pieraccini's "Patologia del Lavoro.")

Then follow mortification in the zone supplied by the choked bloodvessels and the formation of a sequestrum, and partly on account of the presence of this necrosed portion and partly owing to the facility with which pyogenic germs pass through mucous membranes, we have the formation of pus.

Third period. It may be easily understood how the periosteum will react against the presence of a sequestrum in the jaw, surrounded by suppuration; we therefore find osteoblasts present more or less in the parts where the periosteal osteogenetic strata are not destroyed. This period of osseous regeneration is the third period, the one which may lead to healing.

From the dental standpoint the clinical progress and the symptoms of the disease have great importance, since the first symptom of the osseous lesion is usually a sharp, violent toothache which seems to settle around decayed teeth or roots, or even around sound teeth if phosphor-necrosis manifests itself in individuals with sound teeth—which is, however, rare. This pain, which may be transient during the earlier days, later becomes persistent and assumes such violence that the patient is driven to seek dental aid.

If the dentist should not recognize the nature of the disease, or if, having recognized it, he should yield to the patient's pleadings and extract the aching tooth or roots, he greatly injures the patient and yet fails to stop the pain, the seat of which is in the periosteum and peridental membrane. Besides, extraction opens a bleeding wound in a diseased bone, through which common pyogenic germs from the mouth will pass, rendering osteitis more acute.

If the patient could be immediately removed from the vapors of phosphorus on the first appearance of the trouble, and were subjected to the topical and general treatment to which I shall presently allude, the disease might be stopped, and at the worst might entail the loss of the few teeth which become too loose to be preserved.

If, however, the patient will not undergo any treatment, or worse still, if he be subjected to operative manipulations, the second or necrotic stage is inevitably induced, with subgingival suppuration, oozing of pus over the alveolar borders, a purple appearance and swelling of the gums, softening and detachment of the soft tissues, formation of fistulous sinuses, and the pronounced formation of sequestra.

The sequestra, which are the gravest factor in phosphor-necrosis, may be so extensive as to entail the whole side of the jaw.

The elimination of these sequestra is naturally very slow and difficult, and when attained may leave serious deformities; for those cases are rare in which bone-formation in the osteogenetic periosteal layer can compensate for the loss of tissue without a deformity being left.

It can be readily understood how teeth

will drop out of the necrosed bone, never to grow again.

During suppuration and while the exfoliation of sequestra is going on, the pus oozing out of the fistulous sinuses and from the alveoli is to some extent swallowed, and naturally injures the digestive apparatus and the whole system, so that one may have cases of real cachexia and amyloid and fatty degeneration of the viscera, especially if the patient continues to expose himself to the exciting cause—that is to say, to phosphorus vapors.

The medical man when called upon to give advice in these cases must at once insist on the patient being kept away from phosphorus, and must combat the acidity of the blood by means of alkaline solutions, especially sodium bicarbonate, administered internally and as a mouth-wash.

Surgical intervention is only indicated after the formation of an abscess or of a sequestrum, and in such cases must be prompt and decided, consisting in incisions and counter-openings, drainage-tubes, scraping (Bogdanik), frequent irrigations with salt water (chlorid of sodium physiological solution, sterilized by heat and used at blood-heat), and exposure to open air. If the kidneys are affected, liquid diet, *i.e.* milk with lime-water; if the urine is normal, vegetable diet (mashed vegetables) and nourishing soups with plasmon or somatose are indicated.

Some authors prescribe potassium iodid and maintain that these prescriptions are without effect. We may safely affirm, after Lalun's researches, that such treatment adds iodin poisoning to the phosphorus poisoning. It is infinitely better to prescribe open-air treatment at the seaside, from which most excellent results have been obtained.

A CLINICAL CASE.

In support of these facts, let me report a clinical case which I consider of some importance. Dr. F. F. Superno, director of the Pontedera Hospital, called me from Pisa to visit a patient affected with phosphor-necrosis who had been working in the match factory of Sig. Luigi Parigi.

Vittoria P., age twenty-four, from Pontedera, had been working in this match factory for some years. She kept on working notwithstanding a marked inflammation in both jaws, dating from a couple of months back.

When I saw her, in April, the conditions were so serious as to oblige her to go to the hospital, where Dr. Superno diagnosed her case as "phosphor-necrosis" and admitted her as an in-patient. She would sit about motionless, apparently suffering; her eyes were dull and sunken, her breath was fetid, there was an almost continual dribbling of pus from the mouth, the lips were cut by the passage of pus, and pus was also issuing from the nostrils and passing through the palatal bones in the median line. The patient had a hoarse voice, and was scarcely able to articulate. She complained of dull headache, and of pains in the loins and the left side. The saliva was extremely acid, the tears acid, the perspiration acid and nauseating. The patient was extremely depressed. She tried in vain to express her thanks when the director told her that I had come expressly to see her, and that I would soon cure her entirely. I confess that I feared at the time that instead of writing the history of the case, I should have to present anatomical preparations; fortunately the patient has completely recovered.

During the acute stage frequent irrigations with bicarbonate of soda and boric acid were resorted to. The necrosed points were touched from time to time with a 5 per cent. chromic acid solution, and the patient was kept out all day in the hospital garden.

In the month of July she was able to travel to the seaside, where she improved daily. She returned in September in good condition. Eighteen months later she was able to bear a plate which remedied the deformity of the face, which had been rendered unrecognizable by osseous erosions and muscular contractions. A year later a still greater improvement of

the features was obtained by a second apparatus. (See Fig. 3—the apparatus being *in situ.*)

through the nostril, especially when a slight congestion of the soft tissues interferes with the fit of the apparatus.

Fig. 2.



She was able to take up work again, not in the match factory, but making match-boxes in her own home, and is now living contentedly.

Fig. 3.



The illustration (Fig. 2) shows that the patient lost completely the bones in the incisor region and the upper alveolar processes, right and left. On the right side the floor of the antrum is gone; sometimes, when the patient is drinking, the fluid will regurgitate

At the request of the owner of the match factory, I, together with Dr. Magni, a professor of chemistry, studied the works and their ventilation. Some advice was given to the workmen with regard to the handling of phosphorus and the use of sodium bicarbonate solutions as a preventive. The very happy result has been that, while there had been two cases in one year, one of which was of a very serious nature, in the nine years following no cases have occurred.

Since then, from other sources, I have had four or five less serious cases of phosphor-necrosis, but having been taken in the first stages they have yielded to hygienic treatment.

I should like to point out that in the Italian laws (see "Testo unico della Legge per infortuni degli operai sul Lavoro," Pietrocola Ed., Naples 1908) no mention is made of the loss of teeth. Let us hope that in reforming the regulations our legislators will bear in mind these organs, which are only too often forgotten, yet which perform such an important function in the preservation of mankind.

IS IT NECESSARY TO USE SECRET FORMULA PREPARATIONS IN THE PRACTICE OF DENTISTRY?

By J. P. BUCKLEY, Ph.G., D.D.S., Chicago, Ill.

(Lecture delivered before the Northeastern Dental Association, Providence, R. I., October 7, 1909.)

SOMETIMES I have a hesitancy and am under a forced embarrassment in speaking of proprietary remedies, because I meet at these conventions manufacturing chemists or their representatives who have certain proprietary remedies for sale. I do not know that I need to feel this hesitancy in speaking of secret formula preparations in this particular part of the United States, when I realize the stand that the Massachusetts State Dental Society has taken through the efforts of your Hopkins, your Squires, and other men whose names I might mention, and also the Connecticut State Society and other societies here in the East who are farther along even than we are in Illinois, despite our strong organization.

If I use the word proprietary instead of the word secret formula, I wish to be understood at the outset that I have no objection to the use of a proprietary remedy, if it is an honest ethical remedy. If there is nothing about that remedy, its manufacture, or constituents which tends to mislead the profession; if there is nothing about it or one or more of its all-important constituents that is not kept secret, I have no objection to its use. If that remedy is not forced upon the public to encourage that which is wrong—self-medication—I have no objection to its use, but if the remedy tends to mislead the profession and the public, if the manufacturer claims that there is in it one or more of the supposedly all-important constituents which is known only to him and his Creator, and distributes that remedy broadcast throughout the laity, teaching them that by its religious use they can keep their teeth from decay, which is not true, then I object to that kind of a proprietary remedy.

The question that I am to answer this afternoon in my feeble way is: Is it necessary to use secret formula preparations in the practice of dentistry? I want to answer that in the beginning by saying that in my opinion it is not, and lest I may be accused of speaking against something for which I do not offer a remedy, I will call your attention to a few remedies that have been useful to me in my practice that are not proprietary, and do not savor of the secret formula variety. You understand, however, that I have no objection to the use of an ethical proprietary remedy.

DEVITALIZING PASTE.

The first prescription—

R—Arsenic trioxid,	5j
Cocain,	gr. xx
Thymol,	gr. v
Lanolin, q. s. to make a paste	

—is a devitalizing paste. I do not know whether or not you are all using pressure anesthesia; I do not know whether you believe with Dr. Ottolengui when he said recently in an editorial in the *Items of Interest* that he does not use arsenic under any conditions—a statement which he modified before me in a private conversation recently; I do not know whether you believe the statement of Dr. B. Holly

Smith when he said that any tooth in which arsenic trioxid, the base of all devitalizing pastes or fibers, has been sealed, is ever after what may be called a lame tooth; I do not know whether you believe the statements of those men who use pressure anesthesia and have discarded arsenic entirely, but I do know from my experience that there are proportionately more sore teeth in mouths of patients today as the result of pressure anesthesia than there are as the result of the use of arsenic. So I would call the attention of those who do not use pressure anesthesia in every case, or at all, to the fact that there are times and conditions in which the old devitalization method is best. This remedy contains arsenic trioxid, cocain alkaloid, thymol, and lanolin. A paste can be made of these ingredients and used as such if desirable, but these constituents mixed will be white, and the cement used to seal it in the cavity near the pulp is white also. The mixture, however, can be colored, as Dr. Black of Chicago and others have suggested, by the use of lamp-black. Here [showing a specimen] I have a preparation which is red. It is a fiber, which is thoroughly incorporated into the paste. The fiber used is so separated that with pliers the quantity of the devitalizing fiber needed can be picked off without producing the stringy effect that results from the use of cotton or any stringy fibrous material with which the fiber is made. The color is red, so that when a white cement is used for sealing it into the tooth, and any of the devitalizing paste escapes, it can be detected by the color. As to the quantity of fiber to be used, I would say that a piece about the size of a pinhead is sufficient. The least amount is sufficient; if any part at all is brought into the tooth, it will be sufficient to devitalize it.

AFTER-TREATMENT OF DEVITALIZED TEETH.

There are two methods of treating teeth subsequent to devitalization. If the pulp is anesthetized and removed, I do not believe it to be the best practice to fill the canal at that time, for reasons which I will not discuss here. If the pulp has been devitalized by the use of arsenous oxid, one of two methods can be pursued in the so-called after-treatment. The one is to remove the pulp at the time of the removal of the devitalization paste or fiber, and then to seal in the canal an anodyne remedy for the purpose of overcoming the irritant effect produced by the mechanical removal of the pulp and whatever irritation may result from the drugs, which will sometimes occur no matter how carefully they have been sealed in. The pulp can be removed and an anodyne remedy sealed in the canal, or the pulp can be devitalized, the devitalizing paste removed, and an anodyne remedy sealed in contact with the pulp tissue. At a subsequent sitting the pulp is removed, the canals are dried, and the roots filled. Fortunately, all my own teeth are vital, but if for any reason in the future one of them should need devitalizing I would have that method applied. The arsenic must be removed at a certain time, depending on conditions with which you are all familiar, and some remedy containing thymol sealed in contact with the pulp. For this purpose I prefer the following prescription:

℞—Menthol,	gr. xx
Thymol,	gr. xl
Phenol (95%),	f3 iij

Thymol has a peculiar but favorable action on dead animal tissue, and for that reason the remedy in contact with the pulp should contain thymol. After a week or ten days the pulp should be removed carefully and antiseptically, the canal dried, and the root filled.

PUTRESCENT PULPS AND ABSCESSED ROOTS.

One condition more than any other which in the past has been treated empirically is that of putrescent pulps. The present tendency is to use a remedy because we know what result to expect from it. I repeat, if there is any one

condition more than another which, until a few years ago, was treated empirically, not along rational lines, it is that of putrescent pulps and abscesses. There are on the market all kinds of celebrated abscess cures. We have all kinds of remedies which are supposed to reach past the end of the root and take care of necrosis and all kinds of complicated conditions—claims that we should not make for any drug. A drug only aids nature in her effort to cure a condition. No drug will cure anything, but drugs will assist nature, and if drugs or remedies are used with any other view except to aid nature too much is being expected. Any remedy, even one of the celebrated abscess cures, if it contains formaldehyd, can be used in rationally treating putrescent pulps and abscesses *provided* the action of the formaldehyd gas is modified. No matter what other ingredients a preparation may have, if its manufacturer gives directions to seal it hermetically in contact with the contents of a canal, it contains formaldehyd gas. Unless certain conditions of sepsis are present in which gas is not formed, which conditions are rare, formaldehyd in solution or in solid form cannot be used satisfactorily unless its irritating action is modified. Formaldehyd is one of the most irritating agents to animal tissue known, and if any of the remedy containing this gas gets past the apices of the roots the tooth will be lame forever, if it has not to be extracted immediately. There should be an ingredient in the preparation that will allay or modify the action of the formaldehyd gas, which can be done by various drugs. A few years ago I suggested using cresol, the formula for which is as follows:

℞—Cresol,
Liq. formaldehyd, āā f3 j. M.

Since that preparation, which was formerly called tricresol, was introduced, it has been recognized by the pharmacopeia. In the compounding of the above prescription, however, a great many druggists insist on using liquor cresolis, which contains linseed oil, potassium hydroxid, and some other ingredients. If you use this remedy, insist that the druggist use cresol and not liquor cresolis. The pure cresol contains the three isomeric cresols, and should be colorless. Equal parts of the formaldehyd solution and cresol mixed appear just as colorless as a fresh specimen of beechwood creasote. Most of the cresol on the market is red, which, if it is real cresol, I would not object to, because it will act the same, providing of course that it is not liquor cresolis, but for one reason, *i.e.* that its red color is liable to stain the tooth, and it is absolutely unnecessary to stain a tooth in treating a putrescent pulp by using this remedy, if the color of the tooth is not lost before the patient presents for treatment. If the color is lost, then it is our duty, after treating the pathologic condition, to restore the color by means of bleaching before the tooth is filled. If the tooth is to be crowned with an artificial crown, the color of course does not make any particular difference. A colorless preparation consisting of the colorless cresol and formalin which is now recognized by the pharmacopeia as liquor formaldehydi may also be used. As far as possible remedies and preparations recognized by the pharmacopeia should be employed. If you are familiar with the pharmacopeia, you can take one or more of these preparations and with the assistance of the national formulary and of the list of unofficial and new drugs approved by the American Medical Association, you can duplicate or improve upon any proprietary remedy that is on the market today. The proprietary remedies are not needed, unless one wishes to use them of his own free will and accord. In other words, it is the dentist's fault if he uses secret formula remedies, and not the fault of the manufacturer who makes them for sale—that is his business.

The next remedy—

℞—Thymoli, 3ss
Calcii phos. præcip., 3j
Used as a powder with formocresol to make a paste.

—is one that I have introduced. This is sometimes used with formocresol to make a paste, using the one as a powder and the other as the liquid. We know the most celebrated abscess cures on the market are sold in the form of pastes. There is no virtue in the powder of these preparations; the only therapeutic value lies in the liquid, and the agent of prime importance in the liquid is formalin, from which the formaldehyd gas is generated. The other ingredients are largely intended to overcome or allay the irritating properties of that all-important constituent.

ROOT-CANAL FILLINGS.

A paste for filling fine tortuous root-canals can be made with the above preparation of thymol and precipitated calcium phosphate as a powder and formocresol as a liquid. This makes a good preparation for working down into fine tortuous canals with a fine smooth broach. I do not know whether all practitioners in New England are supposed to fill such roots up to the apices, as some men claim in the West, but I know that I cannot do it. If I can enter a canal with an instrument, I fill it with gutta-percha, but if a canal is inaccessible I would rather use something else than a gutta-percha cone, which I know I cannot introduce into the canal. Any canal that I hesitate to enlarge with sulfuric acid or with various drills and broaches I fill with this paste made of thymol, precipitated calcium phosphate, and formocresol. In treating an abscess in a deciduous tooth—a tooth that the orthodontist tells us should not be extracted, a first or second molar, for instance, in a little child seven or eight years of age, the roots being partially absorbed, pus oozing through the broken gum, coming from the partially absorbed roots—some pleasant preparation, such as cinnamon water, is first applied, to get the confidence of the patient and to enable us to open the pulp-chamber of the tooth. The pulp-chamber is then washed with this pleasant solution, and a pledget of cotton is applied for a few minutes. After removing this, the pulp-chamber is packed with the paste, no special effort being made to introduce it into the canals, and the paste is sealed in with a quick-setting cement. After the cement has set, a portion of it can be drilled out and covered over with amalgam. If the cement is sufficiently durable it is left in place, and it is surprising how these abscesses on deciduous teeth dry up, so to speak, inside of twenty-four hours; if there is no complication of the bony tissues the tooth will remain quiet until a time when one need not hesitate to extract the tooth because of the age of the child.

I do not believe in capping pulps unless there is some good reason, but if I have to treat an almost or entirely exposed pulp in a first permanent molar of a little child seven or eight years of age, I would use every means to save the pulp until such time as I knew the roots to be fully formed. If there is an exposed pulp in the permanent teeth, unless there is some good reason for doing differently, I generally take my chances on filling the roots, tortuous though they sometimes be, rather than to drill through a gold inlay or filling and to have to treat an abscess six months or a year or two afterward. In deep cavities in molars and bicuspids in which we have every reason to believe that the pulp is not infected, we should use our best efforts to save the pulp if it is possible to do so. In such cavities I like to insert an intermediary between the filling and the pulp. If there is only a small layer of dentin, and the pulp in all probability is unaffected—if infected there is small chance of saving it—after thoroughly sterilizing the dentin and removing the carious portion, I use the thymol and precipitated calcium phosphate as a powder, and as a liquid not formocresol but the phenol compound, which contains menthol, thymol, and phenol. It contains thymol, which has a peculiar and, I repeat, favorable action on animal tissue. In fact, thymol was a constituent of the old mummifying paste. I do not mean the mummifying pastes used in

dentistry, but, as far as we have been able to determine, that which thousands of years ago was used by the Egyptians, who could mummify in a way that we cannot do today.

GUTTA-PERCHA.

Canals of ordinary size I like to fill with gutta-percha, which is non-absorbable. There are many ways of using gutta-percha for this purpose. Some moisten the canal with chloroform and then insert a gutta-percha cone. Others use a solution of gutta-percha in chloroform and eucalyptus oil, allowing the chloroform to evaporate, moistening the canal with the solution, and then inserting a cone. If eucalyptol is used for any purpose in connection with the filling of root-canals, one must be sure that eucalyptol is used, and not the commercial oil of eucalyptus. Every tooth that is moistened with commercial oil of eucalyptus will become sore, so to speak. More pericementitis is probably caused by using what is labeled eucalyptol but is commercial oil of eucalyptus, than from any other one source in connection with the technique of filling roots.

EUCALYPTOL.

The oil of eucalyptus is distilled from the leaves of the eucalyptus tree, which grows abundantly in California and Australia; in both these countries men gather the leaves of all kinds and species of eucalyptus, and consequently the oil distilled from that is impure. Only the leaves of the special species *Eucalyptus globulus* should be used, and only men trained in botany and able to distinguish it from other species of eucalyptus can collect these leaves. The oil obtained by the distillation of the leaves of the eucalyptus globulus does not have the irritating properties of the impure eucalyptus oil. I emphasize this because so many teeth become sore owing to the dentist's use of impure oil of eucalyptus.

The next remedy—

℞—Menthol,	gr. ij	
Thymol,	gr. iij	
Eucalyptol,	f3j	M.

—is what I call eucalyptol compound, used for the purpose of dissolving gutta-percha, so that when the cone is inserted into the canal, it will go "home," and will not curl up. When used in this way, the cone will go to its place and fill the canal perfectly, if care and judgment be used in inserting it. Eucalyptol, while it will dissolve gutta-percha, is not a good antiseptic; it is irritating, though not so much as the oil of eucalyptus, but in the above formula its irritating properties are modified by the menthol, and its antiseptic properties are increased by the thymol. If, however, too much thymol or menthol is added, its power of dissolving gutta-percha may be destroyed. I found by experimenting—although I do not approve of empirical claims—that five grains of the two ingredients, menthol and thymol, will not destroy the solvent power of the eucalyptol for gutta-percha. This preparation used with the gutta-percha makes a creamy substance, which is used to moisten root-canals before inserting the gutta-percha cone.

ABSCESSES.

In abscesses, ordinarily, if the cause of the infection and the subsequent abscess is controlled, nature will do the rest. If in an abscess with a sinus the contents of the putrescent canal which have caused the infection and produced the sinus are thoroughly removed by chemical or mechanical means, nature will generally heal the sinus without cauterizing. Cauterizing may be indicated, but ordinarily, unless there is some complication, simple treatment of the root in the usual way will cure the sinus. In bone or root complication, however, the sealing of any remedy into the root-canal cannot be expected to produce a cure. Sometimes we find a roughened end of a root or process through which the abscess has burrowed its way

in order to find an exit. In such a condition it is necessary to surgically smooth up the roughened portion so that nature can heal the tissue in that particular part. If any irritant is left, be it a roughened edge of bone or an absolutely denuded root, nature will not cure the sinus by a drug or remedy simply sealed in the canal. In complicated abscesses, good results may be obtained by forcing phenol-sulfonic acid in contact with the bone or forcing it through the tooth and sinus, adding as much water as you have of both constituents, and using it in a fifty per cent. strength.

PHENOL-SULFONIC ACID.

There is a little trick of pharmacy associated with this remedy. If water is added to phenol-sulfonic acid, it will precipitate the phenol. If, however, the phenol is heated, and while it is hot an equal amount of sulfuric acid is gradually added, and then, while the mixture is still hot, an amount of water equal to the mixture, phenol-sulfonic acid fifty per cent. in strength is obtained, which can be diluted to any strength and used wherever indicated. Sometimes this solution is applied in pyorrhea pockets. I do not like to use acids in treating pyorrhea because a hypersensitiveness of the teeth is produced by their use. It is seldom necessary to use acids in treating pyorrhea, but sometimes the pus persists in forming in a pocket even after the roughened portion of the bone and all of the destroyed pericemental membrane seems to have been thoroughly removed mechanically or surgically. This flow of pus is sometimes stopped by injecting phenol-sulfonic acid into the pocket. In that case a fifteen per cent. solution suffices, but unless the precaution of heating the remedy in making it has been taken, the solution cannot be diluted without precipitating the phenol.

EUROFORM PASTE FOR ABRADED SURFACES AND EXPOSED PROCESSES.

The next remedy, which I have called euroform paste—

℞—Europhen,
Orthoform, āā 3j
Liq. petrolatum, q. s. to make paste

—is a specific for pain due to an exposed process or denuded surface.

That word specific has two meanings: When applied to a disease, it means syphilis. Physicians use the term specific disease to cover the stigma associated with the word syphilis. When applied to a remedy the word specific means a remedy on which we can absolutely rely in that it will produce certain definite results in certain pathologic conditions. Antitoxin is an absolute specific for diphtheria if taken in time. Quinin is a specific for malaria. Potassium iodid is a specific in tertiary syphilis, and mercury in the secondary stage, whereas potassium iodid is worse than useless in the secondary stage. Formocresol is an absolute specific for putrescent pulps. We have but few specifics in medicine and dentistry, but we do have a few on which we can rely, if they are used judiciously and properly.

The preparation which I have above called euroform paste is an absolute specific for pain caused from abraded surfaces. In a burn, for instance, the pain can be stopped almost immediately by the application of euroform paste. If in extracting a tooth some of the process has been torn away with the roots, if the tissues are torn in the extraction of a tooth, if in your efforts to remove badly broken-down roots the process has been spread, exerting pressure on the peripheral nerve ending, or in any abraded surfaces, equal parts of orthoform and europhen made into a paste with liquid vaselin and applied to the part will stop the pain like magic. This preparation is as satisfactory as formocresol, which acts as a specific if used when indicated.

BISMUTH PASTE.

The next preparation I wish to speak of is bismuth paste:

Bismuth subnitrate,	30 per cent.
Vaselin,	60 " "
Paraffin,	5 " "
Wax,	5 " "

Mix while boiling.

This is the formula of Dr. Beck of Chicago. Dr. Beck first used bismuth paste in making skiagraphs. After injecting a sinus with the bismuth paste, the skiagraph would show the complete outline of the sinus, the bismuth paste appearing black under the X ray. On one occasion Dr. Beck treated a tubercular patient who had a sinus extending along the spine. The patient had been under treatment a long time without success. Wishing to take a skiagraph in order to ascertain the extent and size of the sinus, Dr. Beck injected bismuth paste, and lacking time for taking the skiagraph, dismissed the patient with instructions to return. When the patient returned, a day or two afterward, he told Dr. Beck that the sinus was beginning to heal. Dr. Beck did not pay much attention to what the patient said, but on examination was surprised to find that the sinus was healing. In that way he accidentally discovered the therapeutic value of bismuth paste. This paste is now being used all over the world by the medical profession, and like other remedies, in cases where it is not indicated—which, however, does not detract from its value as an excellent remedy.

Bismuth paste may be used in dentistry in the following manner: If a chronic abscess fails to respond to surgical treatment, and a skiagraph shows a denuded root with no pericemental attachment in the apical area, instead of extraction the root can be amputated. After treating the excised end of the root and curetting the parts and the process involved, the wound is packed overnight with europhen paste, which is an absolute specific for pain. It is incorporated into sterile gauze and packed into the cavity for the purpose of controlling the pain. This paste also affords an optical examination of the condition, by which it can be ascertained whether the operation has been performed thoroughly or not. If it has been properly performed and granulation has set in, the sinus is filled with bismuth paste by means of a special syringe, which is supplied by any surgical instrument maker. The syringe containing the paste should be warmed just a little so as to soften the paste, and then sufficient of the paste is injected to completely fill the sinus or cavity.

The actual value of bismuth paste in these conditions has probably been overestimated. Its real value seems to consist in that the sinus is filled with an oleaginous paste. The bismuth paste is an astringent and will slightly irritate and stimulate all the surfaces of the sinus as desired. By the application of this oleaginous preparation water is excluded; this water (saliva) is laden with bacteria of all kinds, many of which are pathogenic in character and will keep up an infection. Thus, while we obtain good results by the use of the bismuth, its curative effect is not altogether due to the antiseptic power of the bismuth subnitrate.

PERICEMENTITIS AND NEURALGIA.

The next prescription to be specified is a liniment that I use in cases of pericementitis and neuralgia:

℞—Menthol,	gr. xx
Chloroform,	f℥ jss
Tinct. aconite, q.s. ad	f℥j

I like to get away from iodin because it stains. Iodin is a true counter-irritant, and when applied to the tissues will dilate the arterioles in deep-seated portions. It will remove the dam, as it were, and allow the circulation to go on; the blood will not become stagnant, and there is not the liability of the blood breaking down to form pus. Iodin, therefore, is sometimes indicated. In cases of non-septic pericementitis, however, I prefer to use a sedative liniment rather than the counter-irritant, the prescription for this liniment being as indicated above.

A PYORRHEA ASTRINGENT.

The following prescription is Dr. Talbot's formula for a pyorrhea astringent:

℞—Zinc iodid,	gr. xv
Water,	♏ x
Iodin (crys.),	gr. xxv
Glycerin,	f5j

Sig.—Use as an astringent in pyorrhea and flabby gums.

Dr. Doubleday in his paper (see COSMOS for March, page 286) refers to certain influences of the ptyalin enzyme of the saliva on starchy foods. When the saliva is mixed with the food in the mouth, the essayist says, the action of the ptyalin in converting starch into crystallizable substances which can be assimilated by the system does not take place in the mouth only, but when the saliva is thoroughly mixed with the food —as it should be with a good set of teeth and when the food is properly masticated—the swallowed bolus goes to the stomach, and the ptyalin continues to exert its influence on the carbohydrates in the stomach, and to convert them into substances that can be assimilated.

MOUTH-WASHES.

A great many of the familiar mouth-washes contain astringents. Some of the statements made by the manufacturers of mouth-washes and tooth-powders, and especially of tooth-pastes, are appalling. They claim that the mouth can be absolutely disinfected. Even if this were possible, I would not care to have my mouth absolutely disinfected. I do not believe that it would be for the welfare of my general health to have all the bacteria in my mouth killed. Some bacteria are there for a purpose, and not all are by any means pathogenic in character. Moreover, the mouth cannot be disinfected by the use of a disinfectant remedy, as bacteriologists have demonstrated that the wall of the animal cell is easier to permeate than the cell-wall of the vegetable bacteria. In a test tube an agent sufficiently strong to kill bacteria can be applied; in the mouth, however, with its animal cells and tissues, the same solution cannot be applied, as it would do more damage than good—it would destroy more animal than vegetable cells.

For some of these mouth-washes it is claimed that they contain an astringent remedy, and that if used religiously and continuously they cure pyorrhea, or will aid nature in her effort to cure it.

Dr. Cook of Chicago, in a long series of experiments on dogs conducted at the Chicago University laboratories, proved that mouth-washes containing astringent remedies, notably zinc chlorid, which is most generally used, interfere for hours with the action of the ptyalin upon the starchy foods or carbohydrates in the mouth. If the mouth is therefore thoroughly washed with an antiseptic mouth-wash which contains an astringent constituent, the physiologic action of the ptyalin in the saliva on starchy foods is suspended, and little benefit is derived from the food without the physiologic action of that enzyme. It is wrong of manufacturing chemists to put upon the market mouth-washes that contain an astringent, and to teach the public that by their religious use decay of teeth or pyorrhea can be prevented. It is the duty of the dental profession to combat that idea.

I have come to believe that if in the treatment of pyorrhea the surgical work is correctly done, not many drugs are needed. There is probably less need for drugs in the treatment of pyorrhea alveolaris, so called, than there is in any other pathologic condition with which the dentist is confronted. In other words, if all of the deposits that produce the irritation, and together with bacteria for which the irritation is an anchor, cause destruction, are removed, the patient's mouth is washed simply with wholesome water, the case will get well if it is curable at all. We cannot cure all conditions of pyorrhea. On the other hand, if the surgical treatment is insufficient, the patient may use barrels of mouth-washes, astringent in character, without being cured. I do not mean to imply that it is not necessary to use drugs. If the surgical work has been done carefully, so as to aid nature in her efforts to overcome the conditions, drugs can be used to advantage, but I do not want you to believe, as some men

would have you, that there is a specific for pyorrhea, as there is no known specific for its cure.

LIQUOR ANTISEPTICUS.

The next prescription to be described —liquor antisepticus f℥viij—is an antiseptic, recognized by the pharmacopeia. If an astringent is wanted, zinc phenolsulfate may be added to this. I prefer, however, to leave it as it is, because I believe that astringent remedies should be applied by the dentist, and not used indiscriminately by the patient.

A LOCAL ANESTHETIC.

The next and last prescription to be discussed is a local anesthetic:

℞—Cocain hydrochlorid,	gr. v	
Phenol,	♏ij	
Aq. menth. pip.,	f℥j	M.

Note: 24 minims contain ¼ gr. of the alkaloidal salt.

There is a demand being made today upon the profession for painless dentistry. This does not mean dentistry which is painless to the operator, or which is advertised in the principal streets of this and other large cities. The dentist can come nearer to practicing painless dentistry, I believe, by the use of cocain hydrochlorid than with any other drug. On the market today we have all kinds of secret formulas for local anesthetic preparations. Some of the makers are honest enough to acknowledge that their preparations contain cocain, while others claim that theirs do not. All kinds of dire results have been produced by the indiscriminate use of local anesthetics the constituents of which the dentist did not know. The above anesthetic solution contains cocain hydrochlorid, the best local anesthetic agent known, at the same time the most peculiar drug of all. There is no known way of foretelling how this drug is going to affect an individual. It will act differently upon different individuals, or upon the same individual at different times. Notwithstanding the fact, however, that cocain hydrochlorid is a peculiar drug, whose action is hard to understand and whose results cannot be foretold, the dentist will use cocain, because it is his duty to do his work as painlessly as possible. If for any purpose a local anesthetic is used the constituents of which are unknown to the operator, and the patient dies, as he is liable to do, the operator is not in an enviable position if brought before a court of justice on a charge of malpractice. On the other hand, if a patient should die after the application of thirty minims of a one and one-half per cent. solution of cocain hydrochlorid which contained one-quarter of a grain of the alkaloidal salt, the testimony of all men of experience would justify the operator before any court. It is therefore advisable to have the above prescription on file at a drug store.

In this way the reason why we should use remedies the constituents of which are known, can be illustrated more forcibly with the use of the local anesthetic than with that of some of the other remedies, which will not be fatal to the patient even if not used as intended.

I hope to have demonstrated the fact that it is not necessary to use secret formula preparations in the practice of dentistry.

A CROWN, USEFUL AT TIMES.

By C. S. VAN HORN, D.D.S., Bloomsburg, Pa.

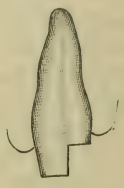
THE dentist is sometimes called upon to utilize as an abutment a bicuspid the root of which is so thin and frail that the use of one or more dowels, as the case may be, is decidedly contra-indicated, and an all-gold crown would be so conspicuous as to be exceedingly objectionable to the esthetic taste of the patient, not to say repugnant to the dentist.

During my practice of sixteen years I have met with a sufficient number of such cases to be led to the conclusion that while they are not numerous, they are not as uncommon as might at first thought be presumed. In fact it was, in part, their frequency that caused me to endeavor to evolve a device or process that would eliminate all display of gold at the buccal aspect, and at the same time would be sufficiently strong to support one end of a bridge. As to how well the crown which is herein described fulfils requirements is left for the reader to decide.

A tooth to meet the ideal for this crown must have a goodly portion of its crown, particularly the lingual aspect, intact. By the use of stones and scalers all the enamel is removed, and the tooth shortened gingivally to give adequate space for gold cusps (masticating surface). Except at the buccal aspect, the preparation is precisely the same as for an all-gold shell crown, *i.e.* the tooth is tapered in such a manner that its greatest diameter is under the free margin of the gum tissue. A measurement is taken, and a band as for a two-piece crown is made (preferably by sweating the joint), adjusted, and removed.

The buccal surface of the tooth is then recessed as shown in Fig. 1. This is readily accomplished by first cutting a horizontal groove across (mesio-distally) the buccal surface of the tooth with a half-inch (No. 133) "thick center and thin edge" carborundum disk, the groove being from 1 to 2 mm. in depth at the center of the tooth and about 2 to 3 mm. below (occlusally) the zenith of the curve of the gum. Then, with carborundum wheels of appropriate shape and size, the portion of the dentin occlusal to the horizontal groove is ground away, and with "Miller's mounted points" (Nos. 226, 228, 229, 234, 235, 236, being a good selection) the resultant recess is trued and finished

FIG. 1.



so that it presents a flat, smooth surface at a right angle to the gingival step. (See Fig. 1.) The depth of the recess can easily be gaged by placing in position a Steele's backing of the proper width and approximate length that has been prepared by filing off the projecting portions of the lug on the lingual and cervical aspects, thus permitting the backing to rest without rocking on the flat buccal surface and butt up against the gingival step. With the backing held in position, the teeth are brought into normal occlusion, and it can be readily seen whether the recess is of the proper depth, and the preparation governed accordingly. The backing is subsequently used to complete the work.

A horizontal slit is now ground in the band, corresponding to the gingival step of the tooth, but as a matter of precaution this slit should be ground about 1 mm. occlusally to the step, in order that a surplus of metal may be had for final truing; the surplus toward the occlusal is then cut and ground away, the final adjusting being done with a safe-edge fine-cut file. Fig. 2 shows the band at this stage, and Fig. 3 shows it in position on the tooth. Please note that the "cut-out" in the band leaves its finished edges exactly flush with the floor and step of the recess in the tooth.

Fig. 2.



Fig. 3.



Fig. 4.



To the cervical end of the backing, which was previously used to gage the depth of the recess in the tooth, a piece of No. 30 gage, 22-k. gold plate, is then soldered at a right angle, with 20-k. solder. This can easily be done by employing the clamps used in connection with Melotte's soldering block or by Dr. Elliott's soldering pliers, to hold the parts in position and in contact. After soldering, the under surface of the attached piece is filed flush with the backing, adjusted, and soldered to the band and perfectly finished. Fig. 4 represents the piece at this stage.

A Steele's facing of proper shade and size, and very thin bucco-lingually, is ground out at its gingival aspect to exactly fit the step and cover that portion of the band that is visible at the bucco-gingival aspect. This is the only really tedious part of the process, but it can be done quite readily with Miller's points of the selection previously given. Graphiting the band helps in that the high places are marked when the facing is

Fig. 5.



Fig. 6.



Fig. 7.

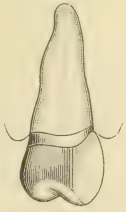


tried in position. If a sufficiently thin facing is unattainable, it is but a small matter to grind one down and polish it. Fig. 5 shows the facing correctly ground and Fig. 6 shows it in position. Fig. 7 shows another facing, and is used to illustrate one of the strong features of this crown, which is the hiding of the gold at the cervix. Fig. 6 shows a case as it would appear under most conditions, *i.e.* the bucco-gingival portion of the band being about 2 mm. in width, 1 mm. being covered by the gum tissue, the remaining 1 mm. by the facing. But suppose 2 or 3 mm. of the band showed, it can as easily be covered by simply grinding an appropriate facing to suit the requirements. This is not only an advantage from the standpoint of receding gums around a case *in situ,* but is useful in cases under construction, in-

Fig. 8.



Fig. 9.



asmuch as it gives additional strength to the band in those teeth which cannot be ideally prepared owing to broken-down conditions, etc.

The band with the facing in position is then placed on the tooth, a piece of pattern wax is softened by dry heat,

placed in position, and the patient is instructed to bite; the cusps are carved, wax is added, if necessary, to make the contour perfect. The whole is removed intact, the facing slipped off, the sprue attached, the appliance invested, dried out, etc., and cast, using coin or 22-k. gold. [For a more detailed description of this part of the work, see Cosmos, May 1909, page 552.] Fig. 8 shows the finished piece, Fig. 9 the same with the facing in position.

Fig. 10.



Fig. 11.



This crown may be used either as a single crown or as an abutment of a bridge. I first made use of it about a year ago in connection with bridge work on a very frail root, but since then it has appealed to me so strongly that I have not confined its use exclusively to frail roots, but have used it as an abutment on some roots that would admit the use of a dowel, believing that better results were obtained.

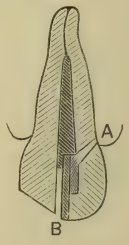
The only objectionable feature in this crown is the effect which the band has on the gum tissue; but sacrifices have at times to be made, especially in bridge work, and this crown is not different in that respect from other bands or collars, all being sufficiently unscientific to be thorns in the side of the really conscientious operator. Some might argue that the cervical "overlap" of the facing would be objectionable on account of its forming a "ledge," but if, after cementing the facing, the cervical part is properly ground and polished, it will so nearly represent the normal cervical convexity that no reasonable objection seems tenable.

Another procedure that has given me and the patient a great deal of satisfaction was the restoration of the buccal half of an upper bicuspid that had been fractured as shown in Fig. 10. But very little preparation was needed in this case; the fractured surfaces were trued and made smooth, and the lingual cusp was ground away at an angle indicated in Fig. 11. An iridio-platinum dowel (0.051 inch) was fitted in the canal, and recessed at its lower end to engage a Steele's backing. (Fig. 12.)

Fig. 12.

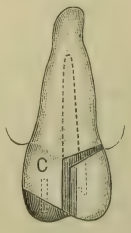


Fig. 13.



The dowel and backing were adjusted to the tooth so that there was a space of about 1 mm. between the backing and the tooth. (Fig. 13, B.) The backing and dowel were then soldered together, placed in position, and a Steele's

Fig. 14.



facing was ground so that its cervical margin came to within about $\frac{1}{2}$ mm., not more, of the corresponding margin of the root of the tooth (Fig. 13, A), the space being greater toward the axial aspect to give an increased thickness of metal, and in consequence, additional support to the root.

The facing is then oiled, placed in position on the backing, and pattern wax

is melted and applied in such manner that the only large surplus is at the occlusal side; while the wax is in a very plastic state, though not "runny," the piece is quickly pressed to place, and the wax molded over the lingual bevel. The ball of the thumb is pressed firmly against the facing, a lingual and gingival pressure being exerted, and the patient is instructed to "bite." The case is carved and cast in the usual manner. Fig. 14 shows the finished crown in position, the darkly shaded portion representing the casting and backing, the dotted lines indicating the dowel, the lug on the backing, and at c the position of the pin, if one be deemed advisable. Personally I favor a groove cut across the incline, bucco-lingually, to counteract torsal stress, but in some instances a pin, as indicated, may be added.

While it is not presumed that either of the above procedures, especially the latter, will be used frequently, yet they are useful when indicated, and they are presented with the hope that they may add to the armamentarium of conscientious operators.

DIETETICS.

By PERCY R. HOWE, D.D.S., Boston, Mass.

THE importance of the diet to the health and vigor of oral tissues and its direct effect on oral secretion have always been recognized in dental literature. Articles on the racial effects of different dietaries have from time to time appeared, advancing the theory that a diet of a specific class of foods produced teeth resistant to fermentative action, and secured sound mucous or glandular tissue with a normal secretion.

It has been shown that the teeth of the guanaco herdsmen of South America, who subsist almost wholly on meat, are practically exempt from decay; also that Eastern races, subsisting on food containing a large percentage of starchy elements, enjoy a remarkable freedom from decayed teeth. It has also been found that the fat-consuming Eskimo is physically well off so far as his teeth are concerned.

The records of semi-civilized people would, at first glance, seem to controvert the opinion that dietetics have any very great bearing on oral well-being. The proteid, the carbohydrate, the fats, proportionally unbalanced as to amounts, do not seem to be provocative of oral disturbance; hence, judged by such a standard, the kind of food would have no appreciable effect, and it is to be presumed that the amount consumed would be subject to the same conditions. However, it is to be remembered that the mode of life of such people is favorable to the process of a more complete oxidation of their food.

Carious teeth and oral complications that come into our hands for treatment belong to civilization, and between savagery and civilization such a wide difference in modes of life exists that, with qualities inbred for generations, what is for the good of one may have an opposite effect on the other. The uncivilized and the civilized are relatively not comparable as to dietary effects.

A review of dental literature shows that in previous years not only food containing lime, but lime itself was advocated, with a view to securing an effective hardening of the teeth, particularly in the case of growing youth. This was urged on the principle that deficiency of lime in the food was a great factor in rapid tooth destruction. An adequate supply of lime is, of course,

necessary, but our present understanding does not agree entirely with this way of providing it. At the present time lack of calcium in teeth is attributed to an unbalanced diet, with functional disturbance arising from a dietary irregularity or from some other cause. Although the exact behavior of the inorganic constituents of our foodstuffs has not been clearly determined, yet we are confident that an amount of calcium salts adequate to make effective tooth-structure is furnished in any mixed diet not deficient in quantity.

Another early opinion was that carious processes were ensuant upon the constant feeding of large quantities of sugars. In following out this opinion and in the effort to explain this action, investigations of the fermentative processes that occur in the carbohydrate media in the mouth were elaborated. The study of oral secretions has revealed plausible evidence in support of the theory that excessive carbohydrate feeding does have a destructive influence that appears in disturbed oral conditions.

It is coincident with these suggestions, derived from oral analyses or intimately connected with them, that the writings most frequently published on the subject of diet treat more specifically of general metabolic disturbance, with particular reference to interstitial gingivitis or to erosion. In the first-mentioned trouble, imperfectly oxidized nitrogenous elements are held to be factors in the complication; while in the next, erosion, the non-nitrogenous elements give evidence of their influence.

These are two distinct conditions. Some go so far as to believe them to be due solely to dietary irregularities of long standing, while the majority agree that diet plays a very essential and causal part in their development and control.

Besides these two types there are many other developments of which we learn from the study of the physiological chemists, who open to us a broader view of the constitutional factors having a direct bearing on our professional field of work. These have largely to do with nutrition and consequently with diet.

Chemistry shows to us that the final oxidation of the nitrogenous elements into ammonia, carbonic acid, and water is the favorable process, though one not always obtained. The non-nitrogenous elements also oxidize into carbonic acid and water. "In defective metabolic and oxidative processes," as one writer has it, "large atomic groups are shed from the biogen molecule which contain no nitrogen (free acids, as lactic, glycolic); a small quantity (amido-acids) or a large quantity (uric acid, guanin, xanthin) as the nitrogenous diet, compared to the non-nitrogenous, is deficient, moderate, or excessive." Excess of any food element means interference with perfect oxidation. Here, then, we see that free acids, *e.g.* lactic, in the bodily secretions means excessive carbohydrate supply. After the system has its needs supplied, the liver stores up what it is able to as glycogen for future use; over and above that, the supply is utilized as fat, or is excreted as water and carbonic acid. From the carbohydrates imperfectly oxidized lactic acid is formed, for one thing —this, uniting with the bases in the circulating media, forms lactates. The lungs, the skin, and the mucous membranes remove, through their glandular apparatus, the carbohydrates, while the kidneys remove a large proportion of the nitrogen. Lactic acid has been detected free in the sweat. The elimination of fully oxidized material in excessive quantities, or of the more complex material, in time produces a condition of strain in the mucous membranes, with increased mucous secretion, the tissue becoming thickened and hyperemic, and causing conditions clinically shown by such disturbances as adenoids, bronchitis, colitis, enteritis, etc.

The literature on this subject of the effect of excessive carbohydrate feeding is extensive, and contains much that is instructive for the practitioner who confines his attention to the oral cavity.

Another combination in the elimination of lactic and other acids of incom-

pletely oxidized carbohydrates is seen in a union with the ammonia of the nitrogen oxidation and the formation of harmless amido-acids. Here, while the proteids are tissue-builders and the carbohydrates the energizers, the need of the one for the other and both together is shown, particularly in irregular physiological processes, since for the safe removal of the lactic acid—which the system does not tolerate free in the circulating fluids—the proteid must furnish the ammonia. This is the condition of slight excess of carbohydrate elements as compared with proteid, with the formation of the amido-acids.

Proteid excess in diet has been often brought to notice in dental literature. The process of formation of uric acid, xanthin, etc., has not been definitely agreed upon. It is supposed to be formed from the decomposed nucleins of the nuclei of the cells and tissue. E. Fisher gave the name "purin" to a hypothetical substance from which xanthin bases and uric acid are supposed to be formed. Gouty diatheses are the principal disturbances of excessive proteid diet that have attracted the attention of the profession. Of late, however, the presence of indican—one of the etherial sulfates—has been noticed in the oral secretions. This product is indicative of intestinal putrefaction of proteids. Even when fully oxidized, proteids leave a solid ash. A certain amount of proteid is absolutely essential to life; it makes good the loss of tissue that daily and hourly takes place, and yet whatever is furnished in excess of need puts unnecessary labor and stress on the digestive and eliminating organs, and in time produces in them some of the many complications with which we are familiar.

In close connection with this subject of the effect of dietary elements within the system is the debt of physiological science to chemistry. Chemistry aims at exact knowledge and results. Its conclusions are reached by analysis and synthesis, by breaking to pieces and by reconstruction, and are as unerring as mathematical demonstrations. It is through chemical examination that we are enabled to detect in the saliva bodies originating in the intestine, or liver, or kidney. Chemistry has determined the products of the operations of micro-organisms, and to it, also, we are indebted for the science of dietetics and its array of facts concerning foodstuffs, nutrition, and related topics—facts that are of the utmost importance not only to the state of health, to vigor, and to cell-resistance of the whole physical system, but also to the part with which we have to do, the oral cavity, which, as we know, is subject to the same general laws as the rest of the body. Dietetics is a distinctive science. It does not belong to the medical or therapeutical science as commonly understood. It is a science in keeping with those progressive principles that are causing departments of preventive medicine to be established in our universities, and in which medicine itself plays so small a part.

Hyperemic, thickened oral tissue, with viscid and perverted oral secretion, with glucose, lactic acid, lactates, aldehyds, acetone bodies, amids, uric acid, indican, together with fatty derivatives, presents an array of evidence that argues less for medication than for a healthful understanding of nutrition. These conditions are indicative of an unbalanced diet, an under-fed or over-fed system, of food too concentrated in form, of the feebleness that arises from muscular inactivity of the eliminating organs, or from organs over-worked and clogged with nutrient material.

It is important to remember that the digestive fluids have but few antiseptic qualities. Miller believed the saliva to possess none, and yet in a mouth teeming with a great variety of bacterial flora a cut heals rapidly. Hugenschmidt holds that the saliva has the power of drawing to it the leucocytes, which are very numerous in the glands of the mouth and tonsils. But a strong point to keep in mind here is that in the defense of the system against invading pathogenic organisms, nutrition is a controlling factor. To the custodians of infective diseases this is common knowledge; vigorous leucocytes and the anti-bacterial

qualities of the circulating fluids depend largely upon it.

In the defenses of the oral cavity nutrition plays an equally important part —first, in keeping intact the soft tissues and maintaining their tone, and secondly, in enabling them to secrete proper fluids that certainly possess defensive action. By constantly bathing teeth and tissue, and acting, when unperverted, as mechanical cleansers altogether unfavorable as a culture medium, containing a positive chemotactic property, the rôle of these fluids is defensive, and they depend on their nutrient support for their equilibrium and for their proportions of protective elements.

It is plain that the dental profession will find in dietetics an interesting subject for extended study and a means of rendering to our patients an efficient service. An effort to become conversant with the standards given us by eminent workers in this field would enable us to put into intelligent practice the very vital and practical principles that science has prepared for our use. The movement that has introduced the giving of food to the children in our public schools and the one that has called for dental examinations among them are two related needs, in which the knowledge of dietetics will make evident the direct bearing that the one must have on the other. Moreover, a working knowledge of dietetics is in accord with present-day ideals and in keeping with the high standards that all kindred sciences are now holding before our profession.

GOD'S POOR, AND A FEW "POOR DEVILS."

AN ADDRESS ON

Free Dental Dispensary Service.

By WM. W. BELCHER, D.D.S., Rochester, N. Y.

(Delivered at the annual union meeting of the Seventh and Eighth District Dental Societies, N. Y., at Buffalo, October 29, 1909.)

IT was some Sagebrush Philosopher, no doubt, who said, "There are three classes of poor—God's poor, the devil's poor, and the poor devils." I have adopted the title of this paper not because of its elegance, but because it expresses a class of poverty I wish to talk to you about at this meeting.

THE DENTIST AND THE POOR.

Abraham Lincoln said, "God must have loved the poor people—He made so many of them!" Perhaps He did—surely they are numerous enough! Robert Grant, in a series of articles that appeared in *Scribner's Magazine* a number of years ago, describes a certain stage of poverty as follows: "You know the kind of family I mean—the one to whom the dentist's bill is an unexpected calamity!" The woods are full of such families—nice respectable people with numerous children, the heads of which are denying themselves the little comforts of life to educate their offspring. They have a stated income and have made provision for clothes, schooling, the baker, the butcher, and the coal man; for life insurance, entertainment, even the chance of sickness, but they have left the dentist out of their calculation, and *his* bill *is* an unexpected calamity! To pay it they have to pinch somewhere;

perhaps the wife goes without a new dress or a much-needed hat—does it cheerfully, and no one is the wiser. God bless those mothers of ours! Perhaps *you* had one who pinched and saved that her boys might have an education. Talk about martyrs! And some people say that because such mothers—yea, fathers—didn't have time or were too proud to go to church and parade their poverty, they didn't go to heaven! You and I know better—most people do nowadays. Yes, they *were* "God's poor"! But it is not of them that I am about to talk, nor of the ninety per cent. of our population that never, or at least very seldom, patronize the dentist. It is THE CHILDREN I wish to speak of as God's poor—mostly children, though there are a few others who will come in this class.

What are we doing for the children of the worthy poor who are sadly in need of dental services? It requires no argument that a family of six with a total income of ten dollars per week and paying three-fifty for house-rent, cannot afford the luxury of a dentist. To the children of the worthy poor, brought into the world without their consent; poorly nourished, without sufficient clothing to cover themselves decently; with a widowed mother or a consumptive father as a bread-winner, it is a duty and a privilege to extend help. We may not give a tenth of our income, but have we a right to give *nothing?*

DENTISTS' CHARITY.

The dentist as a dispenser of charity is a joke! You seldom see his name in the list of contributors for the relief of the deserving poor, nor even of his brothers. I know of a dental organization that contributed fourteen dollars for the relief of the dentists of the Galveston disaster—not enough to buy one of them a second-hand foot-engine; and that organization felt particularly virtuous. The dentists of this great country of ours, when Dr. Barnum died, the man who discovered the use of the rubber dam and made of it a free gift to the dental profession, presented to his widow, as the result of months of effort, the paltry sum of five hundred dollars, which she at first refused with scorn, but subsequently accepted, her need being so great.

Another example was a man named Cogswell, a dentist of California, whose particular penchant was prohibition. He announced that he would give, to all who applied, a drinking fountain, where man and beast might quench their thirst. Dr. Cogswell was a handsome old gentleman, and knew it. The fountain consisted principally of a statue—of Cogswell! In fact, it was so much statue that you had to get very close to see that there was any humidity to it. Rochester had one of these, in its green and salad days, and was not particularly proud of its acquisition. Someone carried it away one dark night, and its resting-place is not known to this day! Another example of the dentist as a dispenser of charity is the late Dr. Evans;—he would build a museum in the city of Philadelphia, for his own aggrandizement!

The dentist as a charity-giver is not in the same class as the physician. There are several good reasons for this. The dentist has long office hours, and is expected to keep them; he has to work hard if he is to make more than a bare living; his office is not a suitable place for dispensing charity. On the other hand, the physician has short office hours; if he is not in his office outside of these hours it is rather to his credit, as he is supposed to be busy. He makes four calls or forty, and has some portion of the day for charity. He performs an operation for appendicitis forty-nine times, and prepares himself for the fiftieth on a patient who is willing and can afford to *pay for experience.*

The dentist cannot do much charity work in an hour or two; nor is he adding to his skill or fame by performing operations embracing no greater field than amalgam and cement fillings, prophylactic treatments, and extracting.

But this does not lessen the need of free dental services to the children of the

worthy poor. Listen to this extract from an article in the *Dental Summary:*

It was found on examination that nearly 80 per cent. of the children in Great Britain's industrial schools were suffering from decayed teeth. Dr. George W. Cook reports, after investigation of 220 mouths, that 171 contained the bacillus tuberculosis, thereby showing conclusively that even that dreaded plague may enter the system by way of carious dental organs. And, by the way, are not the avenues of infection of most specific diseases by the way of the alimentary canal, and especially so where unhygienic, putrefactive conditions of the mouth exist?

In the third annual report of the city of Strassburg, of 2269 children examined between the ages of three and four, only 362 had good teeth—less than 16 per cent. Of 2103 between the ages of six and eight, only 160 or 7½ per cent.; and the report goes on to state that this third annual report shows a remarkable improvement in general health of the public school children—less headache, earache, and stomach trouble. I wonder what must have been the condition there prior to the introduction of compulsory education in the care of the teeth! A further report from same source states that in one school of 700 pupils, of 500 between ten and eighteen years of age 50 cleaned their teeth, 275 used a brush sometimes, 175 did not even own one; and of 200 in the primary departments, between the ages of six and ten, only 10 had a brush. It was this alarming condition of decay that caused the erection of a dental hospital there for the exclusive use of school children. Every child is subject to a dental examination on entering school and twice per year thereafter until the age of thirteen.

In Germany, of 20,000 children between the ages of six and sixteen, 95 per cent. had dental caries in alarming proportion.

In Freiburg there is established a municipal school dental clinic, the faculty of which examines the teeth of all the children, whether school children or not. Each child is furnished with a card bearing the history of the condition of his teeth on the date of examination, and on the back of the card are printed instructions for the care of the teeth. The parents of children found to have defective teeth are notified, and at the same time are requested to send their children to the dental clinic for treatment at the expense of the city.

In England, 75 per cent. of all the children are sufferers from unhygienic condition of the mouth.

In Frankfort, of 1020 children (482 boys and 538 girls) examined, there were found 28,673 defective teeth. Boys had 12,826 and only 2116 sound, and 15,747 of girls' teeth were defective, with only 931 sound ones; 293 girls, or half of the total number, were suffering in general health in consequence of decayed teeth. These figures go to show that 90 per cent. of all teeth examined were defective.

Conditions are the same in this country—worse if possible;—are not the American people said to have the poorest teeth in the world?

FREE DENTAL DISPENSARY.

It was in recognition of this alarming condition that the Rochester Dental Society determined to establish a free dental dispensary for the treatment of the worthy poor—God's poor.

A previous attempt at the Rochester City Hospital some twenty-five years ago had, after a trial of two years, been abandoned. When you mentioned Free Dental Dispensary to the older members, it was to smile. A few of the younger members persisted in the feasibility of the project, and a committee was appointed, and after serving four years, reported that Mr. Henry Lomb of Rochester would advance a sum of money sufficient to equip a free dental dispensary, to be the property of the society.

On receipt of this report the committee was enlarged and empowered to secure accommodations at some one of the hospitals of the city. After a thorough canvass it was found that none of them could offer quarters with suitable light and other essentials of a successful dispensary. At this juncture the Rochester Public Health Association offered the use of rooms well adapted for the purpose, and it was decided to establish the dispensary at the headquarters of the association, 32 S. Washington st., the association to furnish heat and light and the services of a nurse to assist at the chair. The sum of $600 was tendered the society by Mr. Lomb, and this was deemed sufficient; but through donations from local merchants and dental

dealers and manufacturers, an equipment valued at $1200 was secured, free from all indebtedness.

A charter was obtained from the New York State Board of Charities, and the dispensary was opened to the public on Washington's birthday, February 22, 1905. The dispensary was open two afternoons each week, and twenty-four members of the society alternated in attendance the first year. Mr. Lomb then offered to pay the salaries of two dentists, one of whom would be on duty from 2 to 5 P.M. each week-day. This offer was gladly accepted, and the plan proved very satisfactory.

We have been associated with the Rochester Public Health Association for nearly five years, and while the arrangement has been unsatisfactory in some ways, it has been the means of popularizing the work. As it is a non-sectarian institution, Jews and Christians, Catholic and Protestant, have felt free to come for services; this feeling might have been absent had we been housed with some special interest or religious belief.

I have been asked, "How did you start this dispensary?" Well, like Topsy, it "just growed." We had only to ask and receive. It meant a lot of hard work; some of the members even washed windows and did menial work for which they would usually hire help in their offices, as help could not always be secured when wanted.

GIFTS FROM DENTAL DEALERS AND MANUFACTURERS.

Let me here make acknowledgment of the many courtesies of the dental dealers and manufacturers. When I was a neophyte, I thought the members of the dental trade a lot of "tight wads," and their pastime seeking whom they could devour. I do not suppose they are all angels, but when it came to donating supplies for our Free Dental Dispensary they proved themselves a lot of good fellows, and this impression has been intensified as I have made their personal acquaintance.

Materials of all kinds have been furnished—one supply house sent us seventy-five dollars' worth of filling materials; another a water-heater and a fountain spittoon; another a cabinet, etc. You may say that this was for its advertising effect; in a degree this may have been true, but what has a concern which has a comparative monopoly of its products to gain by donating its goods; they have been ever ready to supply us without price, even to paying the freight charges. I only mention this one instance in passing; many others were equally generous, and if we had not been in great haste to open our dispensary, I am sure we could have secured a complete outfit without money.

We are about to establish a branch of the dispensary in one of our public schools, and I have no fear but that the dental trade will be equally generous. We are in a somewhat different position than we were when starting; most of the members of the dental trade had little faith that we would make good, but if a dentist wanted to give something to the public they would help him to be foolish, and stand back and say, "I told you so."

Our dispensary had been open two years when I met one of the local dental dealers on the street, who accosted me with, "How is the dispensary—is it running yet?" "Is it running? Come down and see. There is not a busier place in Rochester, and every child treated is absolutely worthy." "That so?—mm!"

One of the manufacturers, to whom we went for a part of our equipment, would not donate; the best we could do with him was a discount of twenty-five per cent. In a recent conversation I chided him for not being more generous with the dispensary at its inception. Said he, "Doctor, if we had realized that your society was to make the success of this work that you have, we wouldn't have charged you a cent for your outfit." So you see we had to overcome some opposition—it wasn't all plain sailing. Opposition in our society—not all agreed as to the advisability of taxing the members for even the incidental expenses of the work—and much opposition from outsiders to whom we would

have looked for encouragement. But we had Captain Lomb, who stood by us to the day of his death, with gifts of money and words of encouragement and good counsel.

ORGANIZATION OF THE DISPENSARY.

To look after the details of the work a dispensary committee was appointed. This was subsequently changed to a board of directors, seven in number, who have full charge of the dispensary and the general affairs of the society. These consist of the president, secretary, and treasurer, also four members who are elected for terms of one, two, three, and four years. They elect their own chairman, and are responsible to the society. Thus we are receiving each year new blood into the board, and as the retiring president and other officers cease to be active members they are in touch with the work, and are pressed into service when most needed.

So far as we know, this is the first free dental dispensary in the United States. Up to date it is the only one to receive a charter from the New York State Board of Charities, and it is watched by them with great interest as the first institution to come under its observation conceived and managed by the dental profession.

INSPECTION OF THE DISPENSARY.

A word in regard to the chartering of charity organizations in New York State. Every charity organization is semi-annually inspected by the Board of Charities. The inspector walks in unannounced and inspects the records and general conduct of the dispensary; he is the agent, and his business is to find all the fault he can, and recommend improvements. A copy of his report is forwarded to the organization, which is given a rating based on this report; the organization's attention is called to anything lacking, and it is expected to remedy the same at once and make a report to the board when this is done. Each year a report of the financial condition and a general statement of the condition of the charity is submitted, stating whether in debt, the amount of property owned, the source of revenue, how much is contributed by the state or county, etc.

At our first inspection, fault was found with the sign, as not correctly stating the hours when the dispensary was open, also that it did not say that the Rochester Dental Society, and not the Public Health Association, was at the head of the charity. A notice of the penalty for false representation was not posted, and the sexes were not separated, with a waiting-room for each and a sign "Male" or "Female" at the entrance. These conditions were speedily remedied, and I am glad to say that we have had a perfect report ever since.

CHARTERS FOR DENTAL DISPENSARIES.

There is a penalty for conducting a dispensary or charitable organization without a charter from the State Board. Everyone cannot be charitable and solicit funds for the maintenance of a charity. If this were not so, any persons could hold themselves out as conducting a dispensary or hospital and use the funds for their own interests. Every quack physician or dentist would be running one or the other, of course charging only for the materials used, and in a short time dispensaries would be as common as charters for dental colleges were at one time in the city of Chicago.

APPLICATION FOR ADMISSION TO THE FREE DENTAL DISPENSARY.

The Board of Charities prescribe a form for applications and insist that all cases shall be investigated, and a record of such be kept, not only of those accepted, but of those refused, and for what reason. A book recording the nature of the services rendered is kept, and must be signed by the dentist in attendance. An individual card is filled out with a record of the work done, and is filed away for future reference should the patient present himself for relief at a future time. This card contains a complete record of the case, and is as follows:

ROCHESTER DENTAL SOCIETY—FREE DENTAL DISPENSARY

Card of admission on representation or statement of patient.

Date

Name Address

Nativity $\frac{M}{F}$ Occupation School No.

No. in Family Income Rent Medical Attendant

Name of Parent or Guardian (IF MINOR)

Father Mother Single Married Color Age Temperament Shape of Arch

Teeth Regular or Irregular Articulation Remarks

This is my application to this Dispensary in the year I have been an applicant to no other Dispensary in the year (or to the following Dispensaries)

The foregoing statement is in all respects true;

Signature of applicant

Sent By Address Certificate

Admitted Refused Investigated

On the reverse side is a chart for recording the nature of the services rendered.

The child is also presented with an appointment card, that must be filled out and signed by the parent or guardian or no services are rendered. A copy is herewith presented:

Rochester Dental Society Free Dental Dispensary

(Under Auspices ROCHESTER PUBLIC HEALTH ASSOCIATION)

32 SOUTH WASHINGTON STREET DAILY 2:00 TO 5:00 P. M.

Name .....

Address .....

No. in Family

Income .....

Rent

School No.

Sent by .....

Mon.			
Tues.			
Wed.			
Thurs.			
Fri.			
Sat.			

Signature of Parent or Guardian .....

ALWAYS BRING THIS CARD WITH YOU (OVER)

On the reverse side is a penalty for false representations, reading as follows:

Penalty for False Representations

SECTION 25, CHAPTER 368, LAWS OF 1899.

Any person who obtains medical or surgical treatment on false representations from any dispensary licensed under the provisions of this act, shall be guilty of a misdemeanor, and on conviction thereof shall be punished by a fine of not less than ten dollars and not more than two hundred and fifty dollars.

(Imprisonment until fine be paid may be imposed. Code Crim. Pro. § 718.)

METHOD OF TREATMENT—CLEANLINESS THE FIRST LESSON.

On their first appearance the little patients are relieved of their immediate sufferings, and, if needed, the teeth are given a prophylactic treatment. The children are asked if they have a tooth-brush and dentifrice; if they have not they are presented with both and instructed in their use, and their teeth are expected to be clean on their next visit; if not, they are warned that they will be sent home. If children have dirty hands or face, they are told that the dentist cannot work for them until they are clean; they are introduced to a cake of soap and a towel in an adjoining room. These children soon learn, and present themselves with improved conditions. The lessons are carried home and must have an influence on the family life.

Quite a number of the applicants are the children of our foreign population. We are helping to make them better citizens, better men and women. The care of the teeth is a step toward the care of the body in general, and with it increased confidence and self-respect.

There happened in Rochester, recently, a brutal murder; as a result six children were thrown on the world and came under the care of the Children's Aid Society. The eldest, a girl fourteen years of age, had been the little mother of the family. "Why are the children so dirty?" she was asked by a member of the Aid Society. "Why, they ain't dirty; they have their faces and hands washed every week," was the reply. What would have been the effect had this little girl come under the influence of our dispensary and been taught its lesson of cleanliness?

Are the children or their parents appreciative of the services rendered?

I think the most of them are—some very much so; they may cry and protest at being hurt, but they get out of the chair with a smile and thank the operator for his kindness, and show an appreciation that one would not expect in one so young. Of course we are imposed on occasionally, but at the worst, it is by a child.

Not all are even grateful. One of the gentlemen connected with an eye clinic told me of an instance of a child whose eyes had been examined and for whom free glasses had been prescribed; the parents resented the fact that the glasses did not have gold mountings!

The health officer of our city has a

high ideal of the value of dental operations, and insists that every child of school age who applies for a working permit shall have his teeth, nose, and throat placed in good condition—thus insuring that the child, once having secured a position, shall be able to render continuous service.

Said one of the lady superintendents of a Rochester school, recently: "I do not know what we would do without your Free Dental Dispensary to take care of the school children." It is an undoubted fact that before its establishment children were kept home from school, and after the school age were denied employment, because of defective teeth.

That the proper care of the teeth has a great influence on the general health is becoming better understood by physicians and laymen. More and more it has become a demonstrated fact that no person's health can be better than his teeth. The value of a sanitary mouth in the treatment of tuberculosis has become well recognized. An essential in the treatment is that the patient shall be able to thoroughly masticate; the teeth must be placed in condition for work. Overfeeding will not avail if the food is an irritant to the digestive tract and is not assimilated. A mouth studded with devitalized teeth and suppurating gums is conducive to a lowering of the vitality of the system; the only preventive is to keep the mouth in a sanitary condition.

The number of patients and operations during the five years is here summarized:

	1905	*1906*	*1907*	*1908*	*1909*
Patients	342	680	966	1524	1673
Operations ...	711	2107	3175	3900	4916

DENTAL TREATMENT FOR CONSUMPTIVES.

It was the practice, on first opening the dispensary, to treat tuberculosis patients; but, for sanitary reasons, this was abandoned. Among our charities we have a free tuberculosis hospital, supported by the municipality, and our patron, Mr. Lomb, volunteered to provide the necessary equipment for dental operations. This was done, and the society paid for the services of a dentist, who was in attendance twice each week, as his services were needed; the municipality, convinced of the value of this service, has recently assumed this expense. This, I think, is the first instance of a dental society taking care of the teeth of poor consumptive patients, free of all expense. There was recently instituted a "day camp" for the treatment of poor tuberculosis patients; we have taken care of these cases also. To do all this it has been necessary to materially increase the annual dues, but with few exceptions the members have recognized the necessity of this action and have cheerfully consented.

PROSTHETIC WORK IN THE DISPENSARY.

Our dispensary was established with a full equipment for prosthetic dentistry. A number of plates were made, others repaired. At best, this work interfered with the general clinic, and as the number of children who demanded our attention increased it was thought best to abandon the prosthetic department for the time, until we had funds to employ more help. This has not been without its hardships, as we have a number of applications from the Tuberculosis Hospital and the Old Ladies' Home for artificial dentures, and in a few of the most urgent cases members of the society have volunteered to do this work in their offices. A number of the inmates of the Old Ladies' Home are munching their food as best they can, waiting until the dispensary shall take up this work again, and then they will have a new set of teeth!

EXPENSE OF CONDUCTING THE DISPENSARY.

What are the expenses of conducting the dispensary? I will try to give you an approximate estimate.

Dentists' salaries. We have paid each dentist in attendance fifty dollars per month for three afternoons each week, a

total of $1200 per year. We have recently decided to pay forty dollars per month, as this is the amount paid in the only state institution furnishing free dental service to its inmates, viz, the State Industrial School. This amount is for two full days and not three half-days. This is not enough—fifty dollars per month is none too much; it is better to pay more and secure competent operators. We have been very fortunate in our dental internes; they have taken a great interest in the work, and I think each one values his opportunity to help these children of the worthy poor as much as his salary. We do not pay for the services of an assistant, but will soon do so; in fact, I think, if the clinic is working to its capacity, a well-trained assistant will more than pay for herself by the increased efficiency of the operator. An assistant to be of value in a position of this kind must not be too young, and must be possessed of good judgment, the salary at the beginning to be about seven dollars per week, annual expense $364.

Rental of quarters. Suitable quarters, if not furnished by a hospital or other dispensary, will cost money; I think the least that could be allowed for this would be, including heat and light, $200 per year. In a city, quarters at this price could be obtained only from a sympathetic landlord and in an inferior location. Unless the dentists have complete control of their dispensary and are free from interference from physicians who do not understand or are not in sympathy with the movement, and invest a house matron with supreme powers, it would be better to pay a rental or establish a dispensary in one of the public schools, if the consent of the board of education can be secured.

Laundry. Laundry supplies cost money. Perhaps you can get them donated. We have found it better to have the laundry company supply towels at fifty cents per hundred than to own our linen, which is always wearing out and disappears in various ways.

Materials. The cost of materials I place at twenty-five dollars per month—this I think is conservative. In our case they have been largely donated. Then there are incidentals; the little things that must be purchased at once, equipment to be repaired, medicines, stationery, printing, and stamps if you would make an appeal to the public for funds, street-car fares for the person making investigations, telephone, etc. I have placed this at $100; that is hardly sufficient. The annual expenditures of conducting a dispensary such as I have outlined would be as follows:

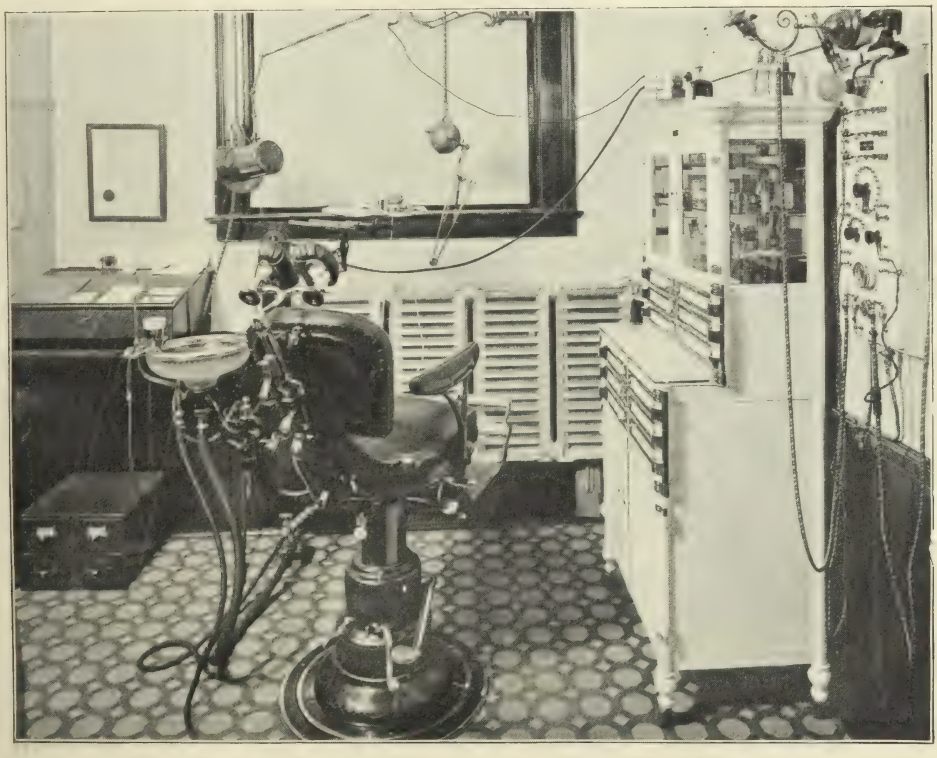
Rent of rooms, with heat and light	$200
Services of assistant	364
Salaries of dentists	1200
Linen	24
Materials and supplies	300
Incidentals	100
Total	$2188

Equipment. If possible, the equipment should be first-class and strictly modern. The first dispensary, at the City Hospital, of which I have spoken, was furnished with an old barber-chair, everything else corresponding; as a result no one took pride in its upkeep and everybody was rather ashamed of it. At best it was not a show place.

You know the old-fashioned school; it was built of wood and had no sanitary conveniences; old painted desks, on which we carved our initials; it was the general rule to deface the building at any and all places. With the advent of the building of brick and marble, with the school flag, the tiled floors and modern sanitary conveniences, the lad who would dare deface the walls of this model school is a culprit, and punishment to fit the crime is immediately meted out to the offender by the boy inmates. It is *their* school, and they take a healthy pride in maintaining it in its highest efficiency, in giving their pennies to secure suitable pictures to decorate the walls, yea, even statuary for the halls. So it is with a free dispensary. If you would be proud of it and would show it to your medical friends it must appeal to your pride. Furthermore, it gives the general public a standard by which to judge the dental profession.

The other clinics established in the Health Association since our advent are not so well equipped, and the medical men conducting them feel that they are rather "poor relation" to the dental clinic. They speak of it among themselves, and are unable to understand why they cannot be as well equipped. So I think the matter of a good equipment is important and very much to be desired. If you cannot see your way to a superior outfit, get an old barber-chair if you must, bring your own instruments and materials, and if your work is pushed and attended to *regularly,* the public will soon realize the value of your charity, and will enable you by their support to secure better things.

Public support. This matter of public support is one that we have had to meet the present year, as our patron Mr. Lomb died, and as the Dental Dispensary was conceived after the making of his last will and testament we were left without funds. It was with a feeling of their inefficiency that the board of directors took up the matter of raising funds. It was determined to send a personal letter to the charitably inclined, and in it give a statement of our work and the needs of the coming year.



Public Dental Dispensary No. 2, situated at Public School No. 14, Rochester, N. Y.

Our city has a population of 200,000, and two per cent. of these support its charities. A complete list of the charitably inclined would contain about 4000 names. As far as possible we have tried to secure a list that would embrace this class. At the time of our first appeal we had a mailing list of 1000, and to these we sent a letter and printed report of operations for four years. Sufficient funds were secured to carry on the

work, but not enough to increase its efficiency. We had hoped to have the dispensary open in the mornings as well as in the afternoons, and thus conduct our charity to its highest standard and economy. This year we hope to secure funds to do this, and to open a dispensary in one of our public schools.

Public school dispensary. The principal of No. 14 school, Miss E. A. Scott, has been very much interested in our work, and asked if it were not possible to have a dispensary in her school for the children of the east side of the city, as in the case of the younger ones it was necessary to send a teacher and pay their carfares. The crowded condition of the dispensary necessitated the making of an appointment three or more weeks in advance; this meant another trip, and loss of time and money. Miss Scott was familiar with the establishment of free dental dispensaries in Germany and Russia—*e.g.* the city of Strassburg with its $60,000 building for its free dental clinic, and eight or nine other German cities that had followed this example and established dispensaries for the compulsory examination and care of the school children's teeth. It has been said that there are at the present time over fifty such institutions in Germany alone. Even Russia has its free dental clinics in various cities, and St. Petersburg, with a population approximating that of the city of Philadelphia, has *nine* such clinics for the treatment of its school children. Why could not Rochester have such a dispensary in one of its public schools?

Why not, indeed! She was informed that, if suitable quarters could be furnished and the consent of the board of education obtained, we would do the rest.

An appointment was secured with the board of education and they gave the project their hearty consent. It is our expectation to equip this school with an up-to-date dental outfit,* and if the services rendered are shown to be a necessity, I am confident the board of education will willingly assume the expense of maintenance.

* [The realization of these plans is shown by the illustration on page 453.—Ed.]

A BI-MONTHLY JOURNAL.

To enable the society to be in touch with the general public and the people who are supporting the charity, as well as those who have been asked to do so —that they shall know what is being done from month to month, and that a financial statement of the same might be presented, and to keep before the public the value of this work and its needs—a bi-monthly publication of eight pages entitled the *Dental Dispensary Record* is to be established, an article of educational value to the general public on the care and treatment of the teeth to be a feature of each issue. We embark on this enterprise with an edition of 1250 copies; the first number will appear January 1, 1910. A small subscription price will be asked, and it is hoped to secure enough actual subscribers to enable us to successfully apply for second-class mail rates.

THE PATIENTS OF THE DISPENSARY.

Another question frequently asked is, "Where do you get your patients from?" From every source—we are a charity of charities. They come from the orphan asylums, Protestant, Catholic, and Jewish; the various hospitals; the Home for the Friendless; the Children's Aid Society; the Society for the Prevention of Cruelty to Children; the Home of Industry; the Door of Hope; the Health Association; the Health Bureau; the Tuberculosis Hospital; the "day camp"; every public and parochial school in the city; from ministers, priests, physicians, dentists, and laymen.

An effort is made to investigate every case. Many of the children coming to the dispensary do not need investigating; their poorly nourished bodies speak for themselves. They have no clothes to cover them decently, and have not had enough to eat since they were born.

They come into the clinic, and look up to you with big, trustful eyes, and are grateful and appreciative. Surely, these are *God's poor!*

DENTAL SERVICE IN PENAL INSTITUTIONS.

But what of the "poor devils"? All over our land they are waiting—in every prison, in every asylum.

Did you ever stop to think of the lack of dental services in our penal institutions? A prisoner is received in one of our state institutions for a sentence of five years; it may be for life. He may be taken with a violent toothache the second day after his imprisonment, and can secure no relief, unless he is sick enough to go to the hospital; perhaps this is overcrowded, and he must wait. If he has money he may call a dentist from the outside world, otherwise he is without dental attention. The prison physician is busy morning, noon, and night; he has 1500 to 2000 patients, new arrivals, five or ten each day perhaps, must be examined, measured, treated; he is willing, but has not the time, and is unskilled in dental operations.

To a prisoner with a bad toothache, discipline is particularly irksome. He knows that the state has no right to confine him behind prison walls and allow him to suffer with no means of relief. In Sing Sing and Dannemora, prisoners are extracting each others' teeth, breaking them off, under the worst sanitary conditions, and infecting the other inmates. At Auburn they have not allowed the prisoners to extract teeth.

The necessity of this work was first brought to my attention by Dr. Mitchell of the Sixth district; and at a meeting of this society, in the city of Elmira, a year ago, I was one of a number of dentists who made an examination of the teeth of about 200 inmates of the Elmira Reformatory. The dental equipment of the prisoners was bad, but I am frank to say that I had expected to find it worse. They were mostly young men of from sixteen to twenty years of age. Some few had a good dental equipment. The conditions were evil enough, but I can imagine how much worse they would be in an institution receiving older criminals. Unless they had money or could secure it from home, they were without dental services other than the busy prison physician could give them. These conditions are recognized at Auburn, as they are at Elmira, and any measure for their relief will meet with the hearty co-operation of warden and prison physician.

DENTAL SERVICE IN STATE ASYLUMS.

Then there are our state asylums for the insane, with no dentist, no dentistry, unless the patient or his friends pay for the same.

We have in the city of Rochester an institution, the Western New York Deaf and Dumb Asylum, where the inmates are taught lip-reading and even speech. These children have no dentistry if they be poor; only as they can afford to pay are they relieved of their incubus of a faulty or poor dental equipment. Think of these children, for whose education the state is annually spending thousands of dollars, with aching teeth, irregular and deformed mouths—and expected to learn articulate speech! Is it not enough to make angels weep?

Did you ever think of a little child born into the world blind—many of them as the result of the sins of their fathers and mothers—a child of the poor, and *blind,* sitting alone in a world of shadows, where it is ever night, with an ulcerated tooth, suffering the torments of the damned! And yet we have an institution situated in the Eighth district, at Batavia, where blind children are received from the age of birth, and, unless they are adopted this is their home until they are of age. Unless they have money they receive no dental service, no relief from their sufferings. Have not these children, God's poor—children born *deaf, dumb, blind*—sufficient handicaps for a life struggle without a faulty dental equipment? In this land of the brave, where all are supposed to be born "free and equal," have not these

children a *right* to free dental services? "For the child, not charity but *justice!*"

Here is our wealthy state, with no direct taxation, and millions for a barge canal, and not a cent for the relief of the inmates of its penal institutions!

If you should go to the legislature and present the dental needs of these institutions, you would be allowed a scanty fifteen minutes with no chance of the passage of a bill for their relief, unless perhaps you had a political pull or could command a certain number of votes; and these children, these inmates of our asylums, "God's poor," and a few "poor devils" in our prisons have *none to offer.* They are defenseless, and *poor.* Do with them as you like—they cannot help themselves; they will continue to suffer in silence. If relief come, it *must* be from the outside.

It is for us, as dentists and professional men, to inform our patients, our assemblymen, and the public in general, through the press and by every means at our command, of this disgraceful condition of affairs, in order that it shall be remedied! For it is not until we have public sentiment behind us that the legislature or the governor will give us any but the scantiest attention. Let us be up and *doing!* "Why stand ye here idle all the day?" "For I was an hungred, and ye gave me no meat; I was thirsty, and ye gave me no drink; I was a stranger, and ye took me not in; naked, and ye clothed me not; sick, and in prison, and ye visited me not."

Let us have *free dental dispensaries!* Let us work for the enactment of a bill that shall place a *dental chair and a dentist* in every penal institution and asylum in the state—for the relief of "God's poor, and a few 'poor devils.'"

CORRESPONDENCE.

REJOINDER TO DR. G. V. BLACK'S REPLY TO "OPEN LETTER."

To Dr. G. V. Black, Chicago:

My dear Confrère,—Your request not to continue our correspondence publicly I cannot grant, for two reasons:

First: Because you accuse me of having unfairly quoted, *i.e.* changed your statements on the specific volume of the tin-silver alloys with other figures taken from German authors.

Second: Because you consider my letter a personal one, and misconstrue the intention with which it was written.

As to the first point, I can easily clear myself. In the January 1910 issue of the Dental Cosmos I have explicitly stated that I had done you an injustice previously, and that your statements on the specific volume of the AgSn alloys were correct, while my own were wrong. In converting the specific gravity into the specific volume I had introduced a wrong formula. The formula which I used I have given in my paper, and if there is any excuse for such an error, it is this: Of all the readers of the Dental Cosmos and of the German journal in which my paper appeared, not one has noticed that that formula was wrong,—*not even you.* After discovering my mistake myself, I publicly announced and corrected it in the January issue of the Cosmos. (This communication was placed in the editor's hands in October 1909.) Consequently I trust you will withdraw your accusation of unfair conduct.

Secondly, I must say that in my letter I used some of your remarks as an occasion to show that not only you, but all dental metallurgists whom I know, including Essig, have an entirely false conception of the physical and chemical

constitution of the metals. To study metallurgy without considering all the fundamental works of Le Chatelier, Roozebom, Tamman, Martens, and their disciples, is like studying medicine without a knowledge of anatomy and physiology.

This I can immediately prove from your reply, but I wish to turn this discussion away from personal channels, as I do not care to find fault with you personally.

What my desire is, I have already clearly stated: I wish to bring it about that dental metallurgy enlarge its range of vision. From the study of the constitution of the metals, from a knowledge of the chemical and physical affinities, dentistry will reap an *a priori* inestimable benefit. Erratic experimenting and endeavor will be replaced by well-directed work. To this I wish to give the impulse. I addressed my letter to Dr. Black, our greatest man, in order to show that I did not mean any individual man, but the whole system.

You have replied to my letter with a number of accusations. I have only refuted the personal accusation of unfair conduct. I am willing to concede that I too am only human and make mistakes, even that I make more mistakes than you. This is immaterial to me; but if, as you say, you know the works cited above, you must acknowledge that the system of dental metallurgy, as it is being taught at present, is built on an entirely wrong foundation. I am working for a re-formation of this foundation, merely as an advocate of the prominent men who have created that foundation.

If you will give me your support in this in the interest of dentistry, whose stronghold, as far as metallurgy is concerned, America especially represents, my high esteem for you will still increase, if that were possible.—as I now beg to remain

Yours very devotedly,

ADOLF FENCHEL.

HAMBURG, GER.

PROCEEDINGS OF SOCIETIES.

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK.

Monthly Meeting, November 1909.

A REGULAR meeting of the First District Dental Society of the State of New York was held on Tuesday evening, November 9, 1909, at the Academy of Medicine, No. 17 West 43d st., New York city.

The vice-president, Dr. B. C. Nash, occupied the chair, and called the meeting to order.

The Secretary read the minutes of the last meeting, which were approved.

Dr. TRACY read the resolutions of regret on the death of Dr. Joseph Wassall of Chicago. On motion the same were adopted.

The paper of the evening was then read by Dr. I. NORMAN BROOMELL of Philadelphia, entitled "The Adventitious Effect of Large Masses of Gold in Contact with Tooth Tissues." The paper was illustrated by lantern slides.

[This paper is printed in full at page 389 of the present issue of the COSMOS.]

Discussion.

Dr. NASH. I will call upon Dr. F. T. Van Woert to open the discussion on this paper.

Dr. F. T. VAN WOERT. It is with a great deal of trepidation that I take issue with Dr. Broomell, but it is a very serious question in my mind as to whether his deductions are entirely correct; whether the conditions he speaks of are due to the large masses of gold, as he claims, and the thermal changes which accrue from it, or whether they are due to the fact that the surface of the tooth, or a large portion of it, is cut off from normal circulation.

I have no means of drawing conclusions from other than clinical experience; but from personal observations I have been led to believe for a number of years that any portion of a tooth that is covered with an artificial material such as cement is bound sooner or later to suffer, if the pulp was alive at the time of insertion of the filling. It has been my practice to eliminate the pulp when a very large filling was to be inserted, as I believe that a portion of the circulatory system is changed in the tooth, rather than that the large amount of metal might cause thermal changes.

I have in mind several cases which are possibly not worth citing, but which I regard as a positive proof for my view. I am not a scientist, but am basing my statements purely upon clinical observation of my patients. My deductions on the lines just stated have proved successful in practice, and to me that is evidence enough to encourage me to continue along these lines.

I doubt whether under a bridge abutment even if set with gutta-percha, the pulp will survive, not because the mass of gold creates thermal changes that would cause a pathological condition of the pulp, but because the external secretions are cut off from the circulatory conditions of the tooth. I may be entirely wrong, and am only stating

my observations in private practice and clinical experience.

On the other hand, if it is a question of thermal changes, and we are to select gutta-percha as a medium for the attachment of a bridge, then I believe these changes to argue strongly in favor of the devitalization of the pulp, because I do not believe that any bridge will be firmly fastened with a gutta-percha attachment entire and not leak. Under the stress of mastication such a bridge cannot stand without yielding in some direction, and if it does yield, the gutta-percha is bound to disintegrate at that point. I have the greatest faith in gutta-percha when applied in its place. I believe that it has been a salvation in many cases that would have otherwise been failures, but it must be used with discretion, and if there is one case or condition above all others where gutta-percha is not acceptable, it is in the setting of crowns or bridges.

I can remember distinctly saying a few years ago—I think to Dr. Evans at the time when he suggested gutta-percha for the partial cementation of crowns—that I thought the time had arrived when we had overcome a great difficulty and could place upon abutments bridges that could be removed and repaired, and thus relieve ourselves of many anxieties that had been paramount in the past. But I never set a bridge or crown with gutta-percha alone without meeting with disaster. On the other hand, the application of gutta-percha on the pin, or the periphery, or the inner surface of the crown, and setting of the crown with cement, is one of the best methods at our command, providing the gutta-percha does not come in direct contact with the tooth.

This might be contradictory to some remarks I have made in the past concerning the virtues of gutta-percha in the salvation of teeth. I have just as much faith in it in that respect as I had twenty-five years ago, but the placing of gutta-percha into a cavity is an entirely different proposition from setting a crown or bridge with it. Gutta-percha inserted into a cavity on the cervix does not undergo any special stress from contact or mastication; but in a bridge it has its proportionate share of movement in one direction or the other. If that is true, how are we to expect that a bridge or crown will remain without creating a pathological condition due to the bacteria that are bound to locate under it.

I believe that when a tooth has to be restored by either a cemented filling, a cast gold or porcelain inlay, a malleted gold or amalgam filling, and the cavity is so large as to occupy a large area of the surface of the tooth, there is a great tendency for the nerve to become devitalized.

Some years ago it was claimed that the arsenic in the cements was the cause of devitalization of pulps, which was later supposed to be disproved; yet many pulps die under large fillings. In Boston I once gave a clinic demonstrating a combination of cement and amalgam, and cement and gold, and stated at that time that this was the operation *par excellence*. I have, however, abandoned that method in excessively large cavities, for almost invariably the pulps in such teeth died.

It has been conceded that the death of pulps in teeth in which large cement linings were used was due to the fact that the cavities had not been properly prepared, and that carious portions had been left. Yet I have evidence from my own practice that in teeth in which no carious matter was left the pulps died, from no other cause than that of the elimination of absorption from the surfaces of the tooth.

This observation is entirely personal, and I am offering it for what it is worth, and if Dr. Broomell can prove to me that I am wrong, I shall feel more than repaid for coming here.

Going back to the days of Dr. Younger and his method of implantation, I remember distinctly several cases in every one of which I tied the teeth into place, and all other conditions being equal they took on the natural color of the other teeth within forty-eight hours. In every case, however, where I made splints of gold and cemented them into place, I failed. If this is not due to

the very cause that I have stated, I would like to have it disproved.

Of all the many teeth which I implanted, every one upon which I did not put a splint of gold covering the tooth and part of the adjoining teeth was implanted successfully; yet whenever I used the splint of gold and covered the tooth to be implanted, not one became firm, and in a great many of the adjoining teeth to which the bridges were attached the pulp died.

If this can be proved to be simply due to thermal changes, I shall be glad to accept the proof.

Dr. A. L. Swift. It is not my custom to extirpate a pulp when placing gold crowns or bridges or even good-sized fillings on a tooth, whenever the pulp is perfectly healthy.

This subject was broached by Dr. Rhein and a few other friends last winter, and Dr. Rhein and the others expressed their opinions so forcibly, and had so much to say against my statement that I went back to my office the next day with the determination to see as many of my cases as possible in which bridges and crowns had been doing service for over ten years. Learning that Professor Broomell was to present a paper on this subject, my desire was increased to secure all possible clinical history. I have examined carefully every case of crown or bridge work that I could reach and in which my work has been in the mouth over ten years, testing to learn if the pulps were vital, and following up the history of the cases as far as possible. I therefore come before you tonight perfectly convinced that my own clinical experience carries out all that I had claimed that evening before Dr. Rhein and others.

The thermal test was made with ethyl chlorid, also the galvanic test.

Dr. Rhein. Have you the exact statistics of your investigations of these cases? I mean the number of cases.

Dr. Swift. No. One particular case happens to be in the mouth of my own father. The bridge was placed twenty-two years ago, two crowns carrying four dummy teeth. It was necessary to remove that bridge to make an addition five years ago. On removing the bridge I examined the abutment teeth carefully, and found them to be vital. I again examined them a few days ago, and am convinced that they are still vital.

In my own mouth I have a bridge carrying a dummy in place of the lower first molar. This bridge was inserted a little over twenty years ago. It had to be removed about three years ago, on account of the porcelain dummy breaking off. The crown was removed, and another put in its place, and now I am positive that the pulp is vital. Besides, it is one of the most useful teeth in my mouth.

The point I raise is that my own personal clinical experience does not warrant the extirpation of healthy pulps when inserting gold crowns and bridges.

I would like to ask Professor Broomell in reference to his slides that show dry gangrene of the pulp—if he has ever made slides of recently extracted teeth, in which the pulp had been devitalized as a result of traumatism, and compared them with the slides showing dry gangrene. A tooth with a crown is as liable as an uncrowned tooth to receive an injury which may result in the death of the pulp. We probably all agree that faulty occlusion of gold crowns and bridges is a potent factor in pulp irritation.

As to the question of using gutta-percha in preference to cement, I tried gutta-percha some years ago, and my experience was similar to that described by Dr. Van Woert. I now would never set a crown or bridge with gutta-percha. I prefer the cement.

Aside from the crown and bridge question, I have also examined in this connection a considerable number of large gold fillings in teeth which were lined with cement, some as far back as 1886 and 1887. I happened to have within the last two weeks several of those cases in my office, and tests convinced me that the pulps were vital.

My clinical experience with large gold fillings lined with zinc oxyphosphate, unlike Dr. Van Woert's, has been on the whole most satisfactory.

Dr. Nash. We are very fortunate in having with us this evening Dr. J. Leon Williams of London, England. We would like to have him speak to us on this subject.

Dr. J. Leon Williams. I remarked to Professor Broomell tonight that I thought his paper was going to be a very difficult one to discuss for those who have not studied the subject scientifically, as he has done. I myself have had no experience in studying this subject from his point of view. I have only clinical experience to offer, or not much more than you have already heard from the preceding speakers. This is an extremely interesting subject, and nothing could tend more strongly to show the necessity for a greater amount of research work in our profession.

This problem might be discussed for a year from our present standpoint and not be settled, because most of us have only clinical experience, and as you have heard from the two speakers who preceded me, clinical experiences differ.

That is true at all times—clinical experience differs. Science comes in then and either confirms clinical experience, or shows that sometimes theories founded on clinical experience are wrong.

It is an open question for those who base their opinions on clinical experience as to what causes the death of the pulp. My experience might be said to be compounded of that of the two previous speakers. In my practice a great many pulps under crowns have been lost, yet a great many also have remained vital. I do not think that the death of a pulp is generally due to the shock from thermal changes, for the reason that this result does not seem to come about when large masses of gold are placed in a tooth as fillings very much nearer to the pulp than is the mass of gold which covers the tooth in a bridge. I have noted that many pulps die although there was very little grinding, and it seemed that thermal shock could not be nearly as great as in a large mass of gold in a filling.

Another point was that the pulps often die when the patient is not conscious of any irritation. None of the effects generally observed when a large mass of gold comes too near the pulp are noted when inflammation of the pulp is caused by shock from thermal change. That leads me to think that the cause of the death of the pulp is in many instances not due to thermal change, but to some other cause. Whether it is due to some small amount of arsenic in the cement, or to that changed condition of the tooth by which it is isolated from the fluids of the mouth, I am not prepared to say.

It has become general practice with many of the best workers to destroy the pulp in most cases; it certainly has in my own practice. Probably in nine cases out of ten I devitalize and remove the pulp before putting on a piece of bridge work —because if one lost a very considerable percentage of pulps, if one lost twenty-five per cent. and saved seventy-five per cent.—I should still consider myself justified in destroying the pulp, especially under the present conditions. Our present aseptic or antiseptic treatment is so much more perfect than it was that the chances for success are much greater than they would be if the pulp were left vital.

The changes which we saw in those slides of pulp sections are not surprising, for the very reason which Professor Broomell mentioned at the opening of his lecture, *i.e.* that the tissue of the pulp is almost of the same nature as embryonal tissue, and therefore very likely to change.

Dr. J. Bethune Stein. I have not had the opportunity to read the essayist's paper, and I do not think I am able to discuss this subject from either a purely scientific or clinical standpoint, yet there are some questions brought forth in and by it that are of interest to all of us who have thought much upon the structure of the enamel, pulp, and dentin. Among others, there is the question of the presence of the dentinal tubules passing up and into the enamel, to which Dr. Williams has alluded. May these be infected? Reference to the presence or absence of caries beneath a filling has been made. Whether or not the carious portions are entirely removed in preparing the cavity is still another

question. Operators remove the carious portion as far as their eyes can see it, which is all a surgeon can do, whether he is dealing with cancer or the infected area above the tooth pulp. It has been conclusively shown by myself and others that dentinal tubules do exist in the enamel of human teeth. They may be a means of transmitting infection from a part of the prepared cavity which is thought aseptic to underlying parts.

Miller never found, as I remember, micro-organisms in the tubuli at the periphery of the cementum, yet they were to be found in other tubuli of the teeth. We cannot doubt that micro-organisms might be in the tubules of the peripheral part of the cementum and set up trouble in the surrounding parts.

The value of this paper appears especially great to me, in that it brings before us a question of how to go about to discover how this process really takes place. It seems as if we must in some way start with the normal tooth, and by making a series of experiments with normal enamel and normal underlying structures work up to the pathological conditions of the tooth.

Dr. R. Ottolengui. Dr. Williams made a wise differentiation when in his remarks he spoke first of clinical experience, and then of opinions based on clinical experience. Facts are facts, but the deduction that one man makes from an observed fact may be quite different from that of another man, because his observation of the fact may be less complete than that made by the other man. For example I wish particularly to refer to Dr. Swift's remarks. Dr. Swift evidently believes that if a tooth responds to certain tests, that proves that its pulp is what he calls vital. Suppose we admit that. Many vital organs are diseased. Many diseased organs are vital. The fact that a pulp responds to thermal changes does not at all prove that an injury has not already been done both to the tooth and the pulp by the presence of the shell crown.

Another good remark made by Dr. Williams was that even if only twenty-five per cent. of crowned vital teeth failed, that would be a sufficient reason for not adopting this practice. Without being at all personal, I want to call the attention of this audience to the fact that Dr. Swift's remarks, which were in favor practically of crowning vital teeth without removing the pulp, were loudly applauded. I do not believe that that applause means that this audience of dentists has any special conscientious scruples about destroying pulps, but I think they have some conscientious doubts about their ability to thoroughly remove pulps after they have devitalized them; and that is the real reason why so many vital teeth are crowned. (Applause.)

The point is this: At the present time I believe there is one great wrong in our dental practice, *i.e.* the poor technique of our root-canal work. We should not be afraid to open any tooth and take out any pulp. If we do not know how to do this, we should either learn or cease to treat teeth.

I have a newspaper clipping just handed to me reporting that the New Jersey Board has been mandamused to give a man a license, and the lawyer, referring to the fact that the man has been indicted for following the profession, makes the claim that dentistry is really not a profession, but merely mechanical work. There is no reason in the world why the layman should not feel that way toward us, if we feel that way toward ourselves. We must cease to feel that we must save a pulp in a tooth regardless of whether it may or may not be diseased, and we must pass beyond the point of believing that because a tooth with a pulp responds to thermal change, the pulp is a safe organ to be left in the tooth. It is not. If we undertake an extensive piece of work such as bridge work, or large gold inlays which must be cemented in, and there is any doubt in our minds about the condition of the pulp, we are, to the extent of our doubt, malpractitioners. There should be no doubt about the foundation upon which we erect the edifice, and we should be able to say to our patient when he leaves the chair that we have left no chance for a tooth to die and to become infected.

and so make it necessary for ourselves or some other dentist to undo the work which we have done, because of any conscientious scruple about keeping a tooth alive, or because of any conscientious doubt about our ability to thoroughly cleanse and fill root-canals.

Dr. Swift. Dr. Ottolengui evidently thinks that it requires more courage to devitalize and extirpate a pulp, and makes a bugbear of the technique for ordinary operators. I think that it requires more courage and exact technique to conserve the pulp and to be free from the everlasting fear that it may die and cause subsequent trouble.

Dr. M. L. Rhein. The substance of the discussion seems to be embraced in practically two questions, disease of the pulp and disease of the peridental region.

I desire to emphasize a few of the essayist's points with a few of my own slides.

The slide on the screen (Fig. 1) represents a pathological condition, showing pulp degeneration, fat globules, and other degenerative processes. This pulp is taken from a tooth that never had a lesion. It had no filling and no break in the enamel surface, and as far as its exterior was concerned was absolutely normal.

The next slides (Figs. 2 and 3) show just the opposite. They represent two portions of a pulp taken from a tooth that had upon it a gold shell crown for almost twenty years.

I wish to dwell upon this particular case, because I desire to emphasize a point that has been brought out here, only not strongly enough, and that is, that in the cases described by the essayist the pulp does not die suddenly; there is, as a rule, a gradual degeneration and necrosis of the tissue, so that frequently in opening into a molar of that kind we shall find two of the roots to contain entirely dead pulps, while the pulp tissue is still vital near the apical portion of the third root. This is not at all an uncommon experience, and these slides represent a tooth of that type, showing the gradual degenerative and necrotic process in the pulp going on.

The black spaces are necrotic areas, and there is just a trace of living pulp tissue between them.

I am reproducing in Figs. 2 and 3 two pictures which were published in *Items of Interest* for August. This is a tooth that would, as far as removing the pulp contents is concerned, cause great difficulties, because there is almost entire calcific degeneration (Fig. 2), and the difficulty of removing a pulp in that condition is known to all of you.

Fig. 1.



The removal of this pulp was intensely painful, because of the difficulty of securing efficient therapeutic action in a pulp with this great amount of calcific condition. But what was the macroscopic condition in this case? The roots were very much enlarged, and the pigmentation of the dentin, as described by the essayist, was most marked. To my mind the part of the essayist's remarks showing the degeneration that takes place both in the enamel and the dentin in connection with diseased pulp conditions constitutes a most important argument as regards the necessity for the removal of the pulp.

The next picture (Fig. 4) represents a most common condition when a radiograph is taken of a tooth with a shell crown that is supposed to be in perfect condition and has caused no trouble.

This tooth never has given the patient any trouble, and the shell crown has been on ten years; but anyone who can read the picture realizes that there is a blind abscess at the mesial root of the molar; and it is simply owing to that condition of quiescence that the patient paid no attention to it.

Fig. 2.



Dr. Blum calls my attention to the fact that in this case there was life in the distal root. This is not an uncommon occurrence. My object in showing these few pictures is in the first place to bring to your attention the fact, as was so pertinently stated by Dr. Williams, that in discussing this question we are entering upon a field that has only been skimmed over, *i.e.* the investigation of diseases of the pulp itself. We know very little about the differentiation of pathological conditions that we find in the pulp, but we have learned that any irritation that has persisted in a tooth for any period of time leaves a pathological imprint upon the pulp, and if irritation is kept up, we find (microscopically) a diseased condition in the pulp that varies considerably in different cases.

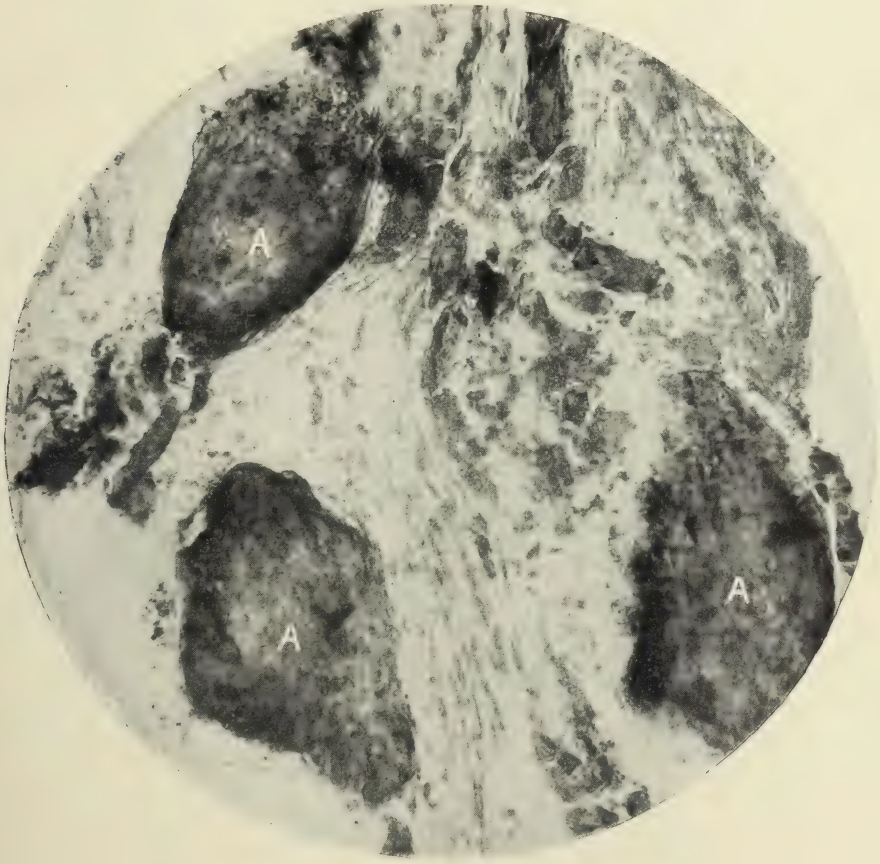
This slide (viz, Fig. 1) shows a pulp that was removed from a tooth because by differential diagnosis it was determined that it was the etiological factor in a very serious case of trifacial neuralgia. The diagnosis proved correct, and there is no question in my mind that the cause of

this irritation of the pulp was simply a condition of malocclusion that existed in the mouth. We have here a diseased condition of the pulp in a tooth without any disturbance of its enamel structure, due entirely to irritation from malocclusion.

extensive restorations in the form of fillings and inlays, in which we do not find the same condition.

In the case of a properly made filling or inlay the tooth, it is true, is irritated; but when the operation has ceased and after a sufficient period of rest has en-

Fig. 3.



Dr. Van Woert spoke of this irritation as being due to a lack of proper circulation. That may be correct. We each have our own individual hypothesis on this subject. Personally, I believe that all the cases described by the essayist are due to irritation, which explains the great variations existing in the great amount of pulp disease due to shell crowns and to bridges inserted on teeth with vital pulps, as compared to the very

sued, there should be a stoppage of the irritation, and whatever disturbances and inflammation of the pulp have taken place ought to end. In the case of a shell crown extending under the free margin of the gum, we have an entirely different condition of affairs. It is undoubtedly true that a shell crown made by a very skilful operator like Dr. Swift will produce a great deal less subsequent irritation than an ill-fitting crown made

by a bungling operator. We all know how quickly the pulps of teeth die from some of the miserable crown work. Yet in spite of perfect work some irritation is bound to remain, if the crown passes under the free margin of the gum.

The insertion of a bridge tends to keep up a greater or less irritation of the tooth. It is almost inconceivable that an operator will always be able to adjust a bridge with the nicety intended by nature, the juxtaposition of the parts being such as to cause no irritation. The etiologic character of the pulp disease depends on the greater or less amount of irritation. In the same way the dis-

Fig. 4.



eased condition of the peridental tissues produces the other symptoms stated by the essayist.

From the meager statistics that have been given us this evening by the essayist, I do not believe that he is warranted in his conclusions as to the benefit that would be derived from the use of gutta-percha. This is an hypothesis on his part that is not borne out by the clinical experience of those to whom we have listened this evening, and of most of the men with whom I have discussed this phase of the question. I do not think that this is the etiologic factor involved, but that the primary cause is irritation. Dr. Ottolengui is entirely right in regard to the question of why pulps are generally left in such teeth. There may be individual exceptions to this rule, but the majority of men practicing dentistry question the results of the removal of pulps in multi-rooted teeth, and as Dr. Ottolengui has so well said, the fear of the outcome of the removal of such a pulp is the deterrent force, and leads practitioners to insert a bridge on abutment teeth in which the pulps are left vital.

The severest criticism that can be raised against the major portion of dental work at the present time is that such a condition should exist while there is no rational or scientific reason why, in ninety-five per cent. to ninety-eight per cent. of the cases of removal of pulps, every portion of pulp contents should not be properly removed.

Before closing, I want to say that one of the main causes of failure is dentists' lamentable lack of knowledge or training in the macroscopic anatomy of the curvatures of the roots of the different teeth. Consequently, when they fail in pulp removal they fear a repetition of the procedure—the only rational method, which alone would enable them to dismiss the patient with the assurance that there will be positively no trouble at any time following the insertion either of a shell crown or a bridge.

Dr. G. Evans. This paper involves so many scientific and mechanical points that I cannot do it justice by a brief discussion. There is a question I would like to ask Dr. Rhein. What was the condition of the tooth shown on the screen when the gold crown was put on? In my opinion no intelligent, straightforward practitioner any longer thinks of capping or crowning a tooth except when the natural crown is broken down to an extent that such an operation is the most practical. In extensively decayed teeth there is more or less degeneration and calcification of the pulp. In such teeth a gold cap crown would probably no more cause the death of the pulp than a filling would.

Dr. Rhein. That is a question which it is impossible for me to answer, as I did not put on the crown. I disagree, however, entirely with the doctor. No matter what the dimensions or size of a filling be, if a pulp has not been in a diseased condition at the time of filling, it will not retrograde into such a

condition on account of the filling, as investigations prove. In fillings that have been in the mouth for thirty or forty years the pulps have been found undisturbed.

Dr. Evans. I will answer Dr. Rhein in this way: In every cavity there are bacteria, which permeate the tubules of the decayed dentin. I always sterilize such dentin. If in large deep-seated cavities this cannot be done reliably at the time of excavating, I place in the cavity a solution of aristol in one of the essential oils, and allow it to remain for a few days. The solution is diffused through the dentin, destroys the bacteria, and removes septic gases.

I believe that most of the gentlemen present will support me in the contention that in teeth which are extensively decayed and have large metallic fillings the pulps are liable to die through calcification in ten, fifteen, or twenty years. Similarly affected teeth, if capped with gold, may die from the same cause. In my practice, which has not been a limited one, in trimming sound teeth for bridge abutments I do not entirely denude the crowns of their enamel, as some practitioners do, nor do I expose all or nearly all the surface of the dentin, as is often done in upper front teeth for the purpose of inserting porcelain jacket crowns. I consider it much better to remove the pulp and use an ordinary crown. In my practice I have noted that not in five per cent. of teeth, if the occlusion in crowned teeth and the strain in bridge work have been carefully studied, do the pulps die. It must be remembered, however, that if in bridge work a cap is put on a tooth with a bridge attached to it, a pressure is put on that tooth far in excess of what nature intended it to withstand, whereby an abnormal condition is established no matter whether the tooth is vital or pulpless.

Dr. A. R. Starr. I acknowledge that I am somewhat afraid to destroy pulps in certain cases, and that I cannot perfectly fill every pulp-canal which requires filling. I believe that some canals are so shaped that none of us can fill them perfectly. If we attempt to fill such canals we may subsequently have to practice alveolotomy and apicoectomy.

In regard to crowns placed over vital teeth causing the death of pulps, I believe that the nearer we approach perfection in bridge work the more likely we are to have destruction of pulps. I sometimes practice poor bridge work rather than destroy pulps. Instead of trimming away a tooth to have the cap fit accurately, I cut away less and put on a partial cap. I think the danger lies in the over-trimming of the tooth and the irritating effect on the pulp of the agent used in cementing the bridge in place. In other words, the oxyphosphate cement is the cause of the death of pulps if the teeth have been too much trimmed.

I never place oxyphosphate cement in a deep cavity of a tooth which is to be filled without first diluting the phosphoric acid solution with an equal amount of distilled water, in order to eliminate this danger.

Another reason why death of the pulp is apt to occur under caps is that the irritating action of the cement attacks the pulp from all sides. The pulp does not have a chance to throw out secondary dentin, and to protect itself against the irritating influence of this material. That, I believe, is the principal reason why devitalization is more apt to occur in cases of crown and bridge work than in fillings. The extra strain on the capped tooth in the case of bridge work, no doubt, is a potent factor in inviting the congestion and destruction of the pulp.

Dr. Ottolengui. I am afraid Dr. Swift misinterpreted my remarks. I simply used his discussion as an introduction to mine. I am satisfied that Dr. Swift is just as good an observer as myself.

It has been said that many of us hesitate to take out a pulp because we are not quite sure that we will be able to follow the root-canals. That is unfortunately true. Many root-canals are difficult and many are impossible to fill. But whatever the tooth may be, the root-work is a simpler problem if the pulp

is taken out immediately than it will be ten or fifteen years afterward, when the canals have been further filled with calcific material. It is a great deal better to undertake this work in the first instance than in the last.

Dr. Rhein. Dr. Evans spoke about pulps dying after years. Such instances are simply due to an imperfect operation, and do not occur if all the carious portions are removed and a perfect filling is inserted. Dr. Evans evidently refers to cases in which not all of the carious matter has been removed. Am I right, Dr. Evans?

Dr. Evans. I cannot quite understand what Dr. Rhein means. In a molar, for instance, with a large cavity and a thin layer of decomposed dentin covering the pulp, the removal of that dentin would cause the exposure of the pulp.

Dr. Rhein. Undoubtedly, such a case has been improperly treated. The pulp should have been removed at the outset, because a thorough removal of the infected area of dentin would have caused an exposure of the pulp.

Dr. Evans. In such a case I would excavate, and leave a sterilized film of decayed dentin over the pulp, cap it, and then fill the cavity. I would expect the pulp to live. It may die in five, ten, or twenty years, but so may the patient.

Dr. Broomell (closing the discussion). It is certainly gratifying to me to have been able to produce a paper which provoked such a generous discussion. I am especially gratified that the discussion has not been one-sided. A great many exceptions have been taken to what has been said. Surely this is advantageous, because argument may always be considered as one of the strongest aids to the success of scientific efforts. If any of these points of the paper are worthy of special consideration I hope they will be those which refer to the diseased condition of the pulp and the peridental membrane resulting from gold crowns.

The remarks made by Dr. Van Woert were to me somewhat perplexing. He spoke of the cutting-off of the external secretions interfering with the circulation. Later he spoke of external absorption interfering with the circulation. If he means by that latter remark that there is an absorption through the enamel into the substance of the tooth, and that this absorption is cut off by covering the tooth with a gold cap, I most decidedly disagree with his ideas, because no such thing exists in human teeth.

Dr. Swift claims to have made some tests as to the vitality of the pulps in certain teeth. One very important feature to be considered in this connection is the fact that pulps which are not vital—pathological pulps—frequently respond more readily to tests than those which are perfectly normal. It is not at all uncommon to find pathologic pulps to be extremely sensitive when an attempt is made to extirpate them, while the extirpation of a perfectly normal pulp can be accomplished with little or no pain. This applies to making the tests to which Dr. Swift referred.

While my assertions have been made regarding the possibilities of what might take place under gold shell crowns, I am free to state that I have been practicing both methods, though perhaps more frequently the crowning of teeth without devitalizing the pulps. In the future I shall be more careful, and it is quite likely that I shall devitalize more pulps before such operations.

What I have presented is simply the result of the labors of a few months. I have refrained from making any statements regarding the way in which these changes may be brought about. I present them to you as I found them.

A hearty vote of thanks was tendered to Dr. Broomell for his instructive paper.

Adjournment.

Herbert L. Wheeler, *Sec'y.*

NORTHEASTERN DENTAL ASSOCIATION.

Fifteenth Annual Convention.

(Continued from page 360.)

THURSDAY—*Evening Session.*

The evening session of the society was held in Sayles Hall, Brown University, at 8 o'clock Thursday evening. Dr. J. H. Monaghan, New York, N. Y., addressed the association on the subject of "Liberty, Fraternity, and Equality: What They Mean."

FRIDAY—*Afternoon Session.*

The meeting was called to order Friday afternoon at 2 o'clock by the president, Dr. Power.

The first order of business for the afternoon session was the reading of a paper by JOHN I. DEVLIN, Esq., Providence, R. I., entitled, "The Dentist and the Law."

[This paper was printed in full at page 309 of the March issue of the COSMOS.]

Discussion.

Dr. J. P. BUCKLEY, Chicago, Ill. It is a pleasure to attempt to discuss this paper. The dentist and the lawyer have a great deal in common; they both accomplish a great deal of good in the world, but there is one distinguishing qualification by which we can tell the dentist from the lawyer, and with which Mr. Devlin may not be familiar: The lawyer is a gentleman (I mean our Illinois lawyers) who always preaches but seldom practices, while the dentist always practices but seldom preaches.

Mr. Devlin said that it was fortunate when the legislature passed the dental law in this state, because it protected the interests of the legitimate dentist. That is not the intent of the law, and the essayist well knows that the law regulating the practice of dentistry is not for the interests of the dental profession, but for the protection of the public from charlatanism and quackery. That this law advances the interests of the dental profession is true nevertheless.

The president has referred to the difficulty which we had in Illinois in trying to stamp out our college diploma mills; where a man in Germany, for example, I regret to say could send over the amount of money that it would require for him to come to this country, to pay his board here for six months, and to return. Upon receipt of that sum the president of the college, who was in league with this secretary of the board, would send that foreigner a diploma, which was registered in the state of Illinois by the secretary of the Illinois State Board. It required a great deal of energy and effort to blot out that stain on our fair escutcheon of Illinois. The dentists of the state learned that they could not touch these culprits by the law on our statute-books at that time; they therefore proposed a substitute which, after a great deal of maneuvering, passed both branches of the legislature. There was in this law a provision by which the state society would have the privilege of nominating three members of the board, the other two to be appointed by the governor; thus the society would control the majority of the board no matter whom the governor appointed. When this bill came before Governor Yates to be signed, he asked this question: "How many members

have you in the Illinois Society?" We looked up the records and found that we had only nine per cent. of the members of the profession in the state society, so he said, "I will veto that bill because it is class legislation. You have the effrontery to come here and ask me to permit nine per cent. of the dentists of the state to have the appointive power of a majority of the board." The bill was therefore vetoed, which we found to be only just. We then approached the problem from another point of view, and fell in line with the tendency of the day, which was organization. In two years' time we had enrolled on the membership of our state society over fifteen hundred members of the profession, or about forty-eight per cent. of the legitimate—ethical, I will say—practitioners of the state.

Then we proposed another substitute for the existing law which was much stronger than the original; it passed both branches of the legislature and Governor Deneen signed the bill, as would have Governor Yates if he had still been in office, because he would not have considered that class legislation. In the last legislature we had occasion to amend the law, and had no trouble whatever in passing three amendments. The first one was concerning the exemption of dentists from jury duty; another clause referred to reciprocity, to which our essayist has also referred, saying that if a dentist moved from one state to another and practiced his profession without passing the licensing examination, he could not recover his fees if the patient refused to pay. We have now a clause governing reciprocity which allows a dentist from another state to practice in Illinois, provided that the qualifications in the state from which he comes are equal to those of the state of Illinois. The third amendment which we had passed was a registration clause requiring every practicing dentist in the state to register every two years, the fee for registration being one dollar. Thus a fund is created to be used as the board sees fit. We feel that, as the result of our efforts along the line of organization, we now have in the state of Illinois a most excellent law.

Dr. C. W. Strang, Bridgeport, Conn. Personally, I have had no experience with the legal profession. We have heard of instances in which dental practitioners have been placed in very uncomfortable circumstances. I know that in one instance the dentists of a certain town, because they had been threatened by suits for malpractice, organized and declined to do any extracting unless the applicant for extraction signed a paper absolving the dentist from any suit for damages in case of injury. It is a blessing to be living in a community where there is nothing of that character to be feared.

Dr. J. H. Worthen, Concord, N. H. Usually our patients look very kindly upon us while undergoing treatment, and in the majority of cases they are just as kindly toward us when they come to pay our fees, but occasionally someone does not think just as we do. I wish to ask the essayist what would have been the results in the following case: I had a patient who absolutely ignored all bills sent for six years and more. I then made an effort to collect part if not all of that bill, but before the patient was brought into court, a settlement was made on a small percentage of the entire bill. The patient claimed that besides being outlawed, the charges were exorbitant. I have always endeavored to charge all patients equally, regardless of whether they be servants or employers, which I presume is not popular, and may not be just right; of late years I have modified that principle. The question I wish to ask is, What basis, if any, had the defendant to claim that the charges were exorbitant, and what would have been the result if the suit had been brought to trial?

Dr. A. J. Flanagan, Springfield, Mass. Every dental practitioner is vitally interested in the question of the law and the dentist, be it that he has bills to collect, or that he is summoned to court, or is forced to serve on a jury. It would therefore be very wise for the state societies to occasionally have an at-

torney to address them on the question of jurisprudence.

Some of my experiences with the law may be of interest to you. I have had the opportunity of being engaged in what might be termed dental political work in relation to approaching a certain state legislature as a member of the law committee, as chairman of the committee on nominations to the governor, and once or twice to the extent of trying to enforce the law in that state. I wish to compliment Dr. Buckley of Chicago on the statement made this afternoon that the main object of all law is the protection of the public or the community against special class interest. All law is for the protection of the public, not the dentist, yet while the written law is for the support and protection of the public, there is an unwritten law resulting from the written one, giving protection to dentists, to doctors, and to various other professions. If we have, for instance, a law which needs support, who is going to enforce it? You will find in the various states of New England laws in relation to the enforcement of dental conditions, but in the vast majority of cases someone has to enforce the law; unless we organize along the lines followed by the Illinois dentists and suggested by Dr. Buckley, we will never get that recognition that we so much desire in regard to the enforcement of the law. For, when it comes to going before a governor or before a legislature to ask for legislation, what right have we to ask for legislation when we represent only nine per cent. of the dental practitioners? What right have we to demand special class legislation? Only if we have sixty per cent. of the practitioners in our organizations will our petitions mean something, because back of it all there are sixty per cent. of professional votes at stake, which means something very tangible to men in public office.

In regard to various dental companies that have been deluding the public, we find that these companies organize and immediately go before the deed registrar, or some other registrar, as the law may be, and record a mortgage against the company for a large fictitious sum. If a case of malpractice comes up later for prosecution, what can you do when Mr. Smith comes forward and produces a mortgage showing that the company belongs to him? This is the condition in Massachusetts. I speak of this in a general way because I do not believe that the laws vary very much in this respect in the six New England states. The chiefs of police in Springfield, Worcester, Boston, and other cities have been approached by people many times for redress from wrongs done in the offices of these advertising companies, and have failed to render aid to the public because of the above conditions. These conditions are due to the ability and sharpness of lawyers who are willing to sell their honor to evade the law—not to enforce it.

The essayist also spoke of the duty of the dentist. If the American Medical Association maintains that dentistry is a specialty of medicine, have we not the right to demand exemption from jury duty on that ground? If the state society would take up that question from the standpoint of the law, and would engage some representative lawyer to carry the case to court, I think that we could demand recognition from the standpoint that the American Medical Association maintains, namely, that we are physicians for the teeth, and physicians in certain states are exempt. We seem to be very lax in demanding our rights. I am sorry to say that in nearly all cases where dentists in the community are violating the law by having unlicensed assistants, or by taking young men and trying to push them into the back door of dentistry and to secure a certificate from the state board, a sorry condition confronts the young man who takes the position of a committeeman trying to enforce the law—for fully seven-tenths of the legitimate, the ethical men, are immediately against the dentist who takes that position to enforce the law. This is a matter of common experience. It is the case not only in Massachusetts but elsewhere, that the

man who accepts a position on a committee of that kind and does his duty is a marked man. He will soon be called something besides a disturber. The profession that picks out a man to enforce the law at least owes him co-operation and appreciation. The lack of co-operation and appreciation by the profession in the past has caused many a man to resign his position with chagrin and disgust. The result is that dental laws in New England today in the vast majority of cases amount to very little on the statute-books, because of want of organization, appreciation, and lack of that true spirit of fraternity which was so beautifully spoken of by the essayist.

Dr. James McManus, Hartford, Conn. A very short time ago I narrowly escaped being drafted for jury duty—in a case in which one of the criminals was sentenced to be hanged and the other to life imprisonment—thus barely escaping a tremendous mental strain.

I was a little surprised when the president asked that this subject be discussed, because we have to obey the law in regard to jury duty, and the only way to get out of it is by appealing to a higher court for a decision as to whether this is law or not.

Unfortunately for me, I have always been bound by respect for authority. Possibly we ought not to have too much blind respect for authority in certain directions.

This paper has been very instructive to us all and I ask that this association give the essayist a rising vote of thanks.

The motion was carried, and the society extended a rising vote of thanks to Mr. Devlin for his paper.

Mr. Devlin (closing the discussion). I am overwhelmed at the extent of your kindness, by its quality, and its quantity. I am glad that my paper has proved interesting, and I find that I have been benefited perhaps more than you have by this meeting.

I was glad to hear Professor Buckley tell of the reciprocity law of his state, whereby a medical practitioner properly qualified in any state, going to Illinois to practice is taken care of by the Illinois law, so that he can recover for the services he has performed in Illinois. I think this association should make its influence felt in Rhode Island legislation so that some similar law would be introduced here, and if a person required the services of an expert surgeon from outside the state, the surgeon would under our law be sure that he could collect the fees for such services.

With regard to dentists' service upon a jury, I am glad to say that in this state they are exempt. The exemption is made by the legislature. The legislature here considers the dental profession as a branch of the medical profession and excuses dentists from attendance on jury duty. The only motive that should prompt a man to wish to avoid the responsibilities of serving upon a jury is his professional responsibility, which is equal to or greater than his duty to the state of serving on a jury. Besides, there are many other citizens who are available for jury duty.

When I mentioned the new law passed in our state requiring all who practice dentistry here to be qualified, and which prohibits a dentist from employing in his office an unqualified person and permitting him to practice dentistry, I said that this law has been a benefit and an advantage to the dental profession. It was this benefit to the profession that I intended to bring out when I mentioned the fact that the law protects the dentist, and I think Dr. Buckley understood my purpose at the time. I admit that the primary object of the law is the protection of the public, but in the operation of the law it works to the benefit and advantage of the dentist, inasmuch as only men who are qualified are entitled to practice dentistry and receive compensation therefor.

I also listened very appreciatively to the jabs from Dr. Strang and Professor Buckley, by whom we lawyers are accused of preaching rather than practicing. I may therefore be pardoned if I have a word to say on that subject. The history of dentistry, which I have read lately, is interesting and amusing

to me. I have learned that while the dentist of today is a member of a profession that is honored throughout the world and is very necessary to our existence, yet in the centuries past he was not such an important member of the community, and I was somewhat amused to find that in the long ago barbers and blacksmiths were employed in extracting teeth, this duty usually developing upon the man with the greatest biceps. Dentistry has advanced in long strides since those days, and I express the hope that in the future the dentist will, by the process of evolution, attain that highest degree of perfection—to wit, the law!

The question put to me by Dr. Worthen is one which I am glad to answer, and reminds me that I neglected to point out in my paper the statute of limitations, to wit, that an account standing for over six years without an attempt to collect it, or without any effort in that direction, becomes outlawed, the law presuming that if a person has a claim, he will prosecute it before six years have elapsed. There are other reasons for this law, one of which is that the person upon whom the service has been rendered or the person who owes the bill will have forgotten about it or may have lost sight of witnesses and cannot defend his case successfully. The law therefore puts upon the creditor the duty of prosecuting within six years, and unless made within that time, his claim is outlawed. A portion of the claim to which Dr. Worthen referred was outlawed. Under the law he would have been entitled to recover for that portion which had not gone the six years' limit.

His second question was as to the value of the service, and what measure of success the defendant would have had in attempting to reduce the charges for the services. That is a question which rests entirely with you, and not with the law. The question of excessiveness of a dentist's or doctor's charges is left with the dentist, and by his testimony the court will be governed. If a dentist or a physician is obliged to sue for an account, the reasonableness of the charges made is left for the profession to determine in this wise: The doctor or the dentist will summon to the court a number of his professional brethren who will listen to the account of the work done and observe the prices put upon the services, and these witnesses, these doctors or dentists, will then testify as to whether or not in their opinion the charges are reasonable for the service performed, and the whole question will turn upon their testimony. Of course the higher class and the more witnesses are produced, the stronger the testimony will be, the character and quality of the men called as witnesses also counting. If Dr. Worthen had brought his case to court, he would put upon himself the duty of proving that the charges were not unreasonable and were in accord with what other practitioners in his locality were demanding and receiving for their services.

I thank the Northeastern Dental Association for the courtesies extended to me, for the attention given to my paper, and for the kind compliments and praise.

The next order of business was the reading of a paper by J. P. Buckley, Ph.G., D.D.S., Chicago, Ill, entitled "Is It Necessary to Use Secret Formula Preparations in the Practice of Dentistry?"

[This paper is printed in full at page 429 of the present issue of the Cosmos.]

Dr. Flanagan moved that the discussion of Dr. Buckley's paper be deferred until 9 o'clock Saturday morning. Motion carried.

Dr. Power appointed the following as the Nominating Committee: Dr. A. W. Crosby, Dr. C. W. Strang, and Dr. W. O. Beecher.

Motion was made and carried to adjourn until the evening session.

Friday—*Evening Session.*

The meeting was called to order by the president, Dr. Power, in Sayles Hall, Brown University, at 8 o'clock Friday evening, October 8, 1909.

Dr. Power, in opening the exercises of the evening, spoke as follows:

I am indeed sensible of the honor which President Faunce of the university has conferred upon us in extending to our organization the strong and venerable hand of friendship. I am conscious of the fact that such healthy, hearty cooperation can and will do more than all other things to help us to accomplish that which modern dentistry stands for —high ideals. It is only through his kindness that it is possible for you to listen to our distinguished speaker tonight.

As president of this organization I grasp that hand of friendship both for my colleagues and myself.

Dr. Power then introduced Professor Munro, Brown University, who spoke as follows:

It gives me great pleasure tonight, as the representative of Brown University, to welcome to Sayles Hall the members of this dental convention and their friends. The halls of Brown are constantly opened to receive conventions of many societies, but there is no profession to which our doors swing open in welcome more willingly than to this, whose members are so intimately associated with all of us.

As civilization advances, the need of the dentist is more and more felt. The savage knows him not. Our ancestors who settled in this region in the seventeenth century had very little need of him. Those ancestors dwelt in semi-savage conditions. Their lives were simple; they lived upon pure food, they drank unadulterated liquors. We, their descendants, unhappily do not. The securing of an adequate food supply at reasonable prices is becoming each year more and more difficult, especially in Providence, as you have doubtless noted in reading your daily papers for the last fortnight or so.

For a number of years purer food has been demanded all over the land. Adulteration has come to be the rule everywhere. In order to meet the wiles of the adulterator, the government needed a *wiley* man. It secured such a one in Dr. Harvey Washington Wiley, then a member of the faculty of an institution which is today one of the largest universities in the country—Purdue University. Dr. Wiley was also at that time state chemist of Indiana. Although he does not approve in general of doctoring, he has himself been doctored by many universities, Harvard among others having given him the LL.D. He has been honored by many scientific societies in this country and in Europe. He is, as I read today in "Who's Who in America," the author of two hundred and twenty-five scientific papers and of sixty government bulletins.

I have the honor of presenting Professor Wiley, Chief of the Bureau of Chemistry of the United States Department of Agriculture.

Professor Wiley then read a paper entitled "The Relation of Dentistry to Health and Nutrition."

After the address of Dr. Wiley, a business meeting was called to order by the president, who called for the report of the Nominating Committee.

Election of Officers.

The Nominating Committee reported as follows:

President—Dr. N. A. Stanley, New Bedford, Mass.

First Vice-president—Dr. H. A. Kelley, Portland, Me.

Second Vice-president—Dr. F. T. Murlless, Jr., Hartford, Conn.

Secretary—Dr. E. O. Kinsman, Cambridge, Mass.

Assistant Secretary—Dr. C. F. Kreppel, Forest Hills, Mass.

Treasurer—Dr. David Manson, Burlington, Vt.

Librarian—Dr. J. H. Worthen, Concord, N. H.

Editor—Dr. L. L. Beach, Bristol, Conn.

Motion was made and carried that the secretary be instructed to cast one ballot for the entire list of nominations as above.

The President then declared the list as read duly elected.

Motion was then made and carried to adjourn until 9 o'clock Saturday morning.

SATURDAY—*Morning Session.*

The meeting was called to order Saturday morning at 9 o'clock by the president.

The first order of business was the reports of committees.

Dr. F. T. MURLLESS, Jr., treasurer, called the attention of the association to the fact that he had received the resignation of Dr. R. W. Brown, New London, and in view of the fact that Dr. Brown is now eighty years old and had long been active in society work, moved that the association elect him to honorary membership.

Motion carried.

Dr. KINSMAN reported that he had in his possession the records of the Merrimack Valley Dental Society and the New England Dental Society, and asked what disposition he should make of them.

Dr. FLANAGAN moved that the records be presented by Dr. Kinsman to the Boston Medical Library for safe keeping.

Motion carried.

Dr. CHARLES MCMANUS moved that Dr. Vincenzo Guerini of Naples, Italy, be elected to honorary membership in the association.

Motion carried.

Dr. FLANAGAN moved that the president, Dr. Power, be empowered to send a letter of thanks and appreciation to the Providence Board of Trade and to Brown University for courtesies extended to the association during the meeting.

Motion carried.

Dr. POWER appointed Drs. A. J. Flanagan and James McManus a committee to escort the president-elect, Dr. Ned A. Stanley, to the chair. After his induction, President Stanley accepted the office in a few well-chosen remarks, and took up the regular business of the association.

Motion was made and carried that the thanks of the Society be extended to Dr. Anthony and the DENTAL COSMOS, and the press representatives of Providence.

Dr. JAMES MCMANUS moved that the thanks of the association be extended to the retiring officers for their efforts in making the present meeting a success.

Motion carried.

There being no further business before the association, motion was made and carried to adjourn until the next annual meeting.

SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

Forty-first Annual Union Convention.

(Continued from page 367.)

FRIDAY—*Afternoon Session.*

The meeting was called to order by Dr. Sharp at 2.30 o'clock Friday afternoon, October 29th.

The first item of the program for the afternoon session as announced by the President was the reading of a paper by Dr. W. W. BELCHER, Rochester, N. Y., entitled "God's Poor, and a Few 'Poor Devils.'"

[This paper is printed in full at page 444 of the present issue of the COSMOS.]

Discussion.

Dr. L. S. GOBLE, Rochester. This essay could profitably be read at every session of every dental meeting of the state for the next decade, and will do more good if assimilated by the dental profession than all the fine-spun pathological hypotheses that ever were sprung upon a weary world.

Dr. Belcher has laid the bald facts before us so plainly that a wayfaring man, though a fool, need not err therein. We have been and are sadly negligent as to our duty toward our poor, and the "poor devils" who cannot help themselves. We are mentally lazy, and I will wager that there are not three men here who have written a letter to his representative at Albany relating the needs of the state in this particular. Each one of us could induce twenty-five persons to write such a letter to the governor of the state, and he would likely call the attention of the assembly to the matter.

Dr. Belcher has touched the cord that vibrates in all our hearts in the climax of his appeal—the cry of the children. If that finds no responsive chord in your heart, all you need is burying. As to the poor devils, one author has said, "Sin is insanity." No one but a crazy man will deliberately hurt himself. Criminals are often criminals from environment, and are no more responsible than the state which permits such an environment, and you can furnish just as good argument for half starving and freezing them as for neglecting their teeth. If bad teeth would not excite to crime or insubordination, I know not what would. All our state institutions should have complete and perfect dental appointments, and we have not done our duty until we do all we can to educate the people to a realization of this necessity and bring about reform. Dr. Frederick Proseus of Rochester read an essay on this subject six years ago at our state meeting, and a committee was appointed to send copies to every assemblyman, but the order was not carried out. Dr. Belcher's data are invaluable, and I hope will have no such fate.

As to the dispensary and kindred work of the Rochester Dental Society, I have little to say. Dr. Belcher's paper speaks for itself, but I cannot let the opportunity pass without honoring the man who was the instigator of the movement in America, Dr. Frederick Proseus of Rochester, who worked alone two years on the project, who got Captain Lomb interested, and through whose untiring efforts and devotion the movement started. But had he not had the best

and most loyal committee to help him, and the hearty co-operation of the Rochester Dental Society, he would have failed.

In time every city in the Union will have its free dental dispensary as an outgrowth of the movement inaugurated in Rochester. But I most strenuously repudiate the insinuation that dentists are behind any other profession in deeds of charity and helpfulness either here or elsewhere. When you take into consideration the heavy expense under which dentists labor you can see that they are a very poorly paid profession, and an operation requiring no more skill than those ordinarily performed by dentists demands, if performed by a medical man, fifty to sixty times the fee. No, Brother Belcher, omit that feature from your essay; it is a vulnerable spot. You have soared with the eagles, but in that respect you have come down and walked in the mud of the earth, and like Achilles, your weakness is in your heels. Then, again, you want to inspire others to emulate you in this good work, and you never can do it by making them think they are no good.

We can forgive the essayist that fling of mud when he speaks of the *blind children*. What a picture! A blind child, maybe deaf and in poverty, yet in his terrible affliction compelled to suffer the agony of a racking pain!

We have all been blind children to our opportunities, and if Dr. Belcher has touched our eyes, we are on the verge of an apocalypse.

Dr. F. A. Ballachey, Buffalo. You have listened to a paper which will prove of great value. I read it with much interest indeed, and I think, with Dr. Goble, that I have been fairly blind to the duties and opportunities of the dental profession. We cannot much longer close our eyes to the fact that a great percentage of the race have not the means wherewith to come to us for dental service, though their distress is no less than that of those who do come and whom we relieve. It is certainly one of the signs of the times when we have a paper like this read, urging us to take measures for the establishment of dispensaries in our cities, and also in our state institutions for the criminal and insane.

There is nothing that I can add to the paper or to the splendid discussion which Dr. Goble has given of it. It comes to us here in Buffalo at a very opportune time, because the dental society of this city has plans under way to commence teaching the children in the schools something more of the importance of their teeth. We hope through the children to reach the parents, and if not the parents of today, then those of tomorrow. If we take steps to teach the people this need, we must in time follow Dr. Belcher's suggestions for the satisfying of that need.

Dr. J. H. Beebee, Rochester, N. Y. I do not believe that any other single charity can reach in its wide range as far as this charity which has been described by Dr. Belcher. There is no man living who can do himself justice when he has an aching tooth. There is hardly a movement on the face of the globe that will advance the comfort of society as much as this movement, the magnitude of whose accomplishments were unknown to me. I wish to thank Dr. Belcher for the paper presented, for it has tended to make me more proud than ever of my membership in this society, by which the movement was started.

Dr. C. J. Barber, Auburn. I have listened to the paper with a great deal of interest, and not previously knowing its nature, I was surprised at its scope. The feature to be regretted in regard to this paper is the fact that its publication and circulation will be limited to the dentists; dentists are to get the paper in our journals, and some of them will read it and some will not, and that is probably as far as it will go. Such a paper should go farther. Dr. Belcher speaks of the people being educated to the needs of dental dispensaries and services of dentists in the different state institutions. Certainly, some method should be employed to reach them. If a paper of this kind could be distributed throughout the state to the proper persons, a

starting-point would be gained. Dr. Belcher has covered the subject so well that some steps should be taken to have his paper brought before the public, either through the state society or the joint efforts of the Seventh and Eighth District Societies.

As far as charity is concerned, I believe there is no class of men who give more for charity than the dentists in their offices every day. The amount of the work they do, the character of the work and the prices they get, bring it about that the average dental office is practically a charitable institution.

Dr. S. R. Meaker, Auburn. I am very much interested in the "poor devils" Dr. Belcher speaks of. I have the fortune or misfortune to be the presiding dentist in the Auburn prison, and I can give a few statistics that I think will be of interest and value to the members present.

I will speak of but a few items that Dr. Belcher did not know about, namely, the attendance in Auburn and Sing Sing. In Sing Sing I understand they have a good equipment, and a man in attendance who is a dentist and an inmate of the institution. He is a good dentist, I am told, and was in reputable practice in Brooklyn at one time, but he is now serving a sentence in Sing Sing. He does work for the inmates, and there is no charge for his services except for the materials. As to the pay for dental work, many of the inmates have money in what is called the "convict deposit," *i.e.* their own money, which they bring with them or which is sent to them. Another source of money is a state fund which provides compensation for each man who works in the state prisons at the rate of a cent and a half for each day of work. If he be punished during his term, he loses fifty cents for each day that he is punished. If he has not earned anything, it is not marked up against him. That is one of the leniencies of the state. This money the inmate can use for various purposes, as buying groceries, clothes, glasses, papers, periodicals, and such other luxuries as the state permits. That is the way in which I get my fee for working for these "poor devils," who are glad to use what they earn at a cent and a half a day for that purpose. Of course there are all sorts of men there, but as a rule they are a good class of patients. Dentistry is one of the few little privileges they have, so they like to take advantage of it. I have seen some men who had to their credit twenty-five or thirty dollars, at four dollars and a half a year. Many of them hoard up their money to take it away with them; others use it as quickly as they receive it, so that if they are punished it cannot be taken away from them.

The only work which I dislike among these men is putting gold crowns on anterior teeth. A man may come to the prison with two or three gold crowns on his anterior teeth, and immediately the others want a gold crown. They are permitted to have them if they have the money to pay for them, and in most cases they are insistent on having gold crowns, and cannot be dissuaded. Our warden also provides a small fund of twenty-five dollars a month, which is divided between the dentist and the oculist, the oculist working under the same conditions as I do. This fund is used simply for necessary work. I examine a patient, and if the work is what I call necessary—of course in our practices we consider all work necessary, but under these conditions what *we* call "necessary work" is ulcerated teeth, teeth with exposed and aching pulps, and some plates —it is marked so in the records, stating why I think it is necessary. These records go to the prison's physician, and he passes on it. He is my censor, and we all cannot help but know that medical men are really not good dental censors—they do not know good dental work themselves. The physician simply passes on these records in this way: He looks up the man's record, and if he has been in good behavior and has not been punished for some length of time he will sanction the work. That is the way in which this small fund, which we call No. 9 fund, is used, simply to make up the difference if the inmate has not a

sufficient amount to his credit to have the work done.

I do extracting gratis, and that is why I spoke this morning of using cocain. I have to use some anesthetic, and I use that so often that I cannot but have some unsatisfactory cases.

The equipment for this work is such as I have been able to get together from time to time—an old chair, a few duplicates of the instruments which I have in my office, and a satchel of instruments which I carry along every time I go. I have for my assistant a young man, an inmate, who has taken much interest in the work, and is really studying dentistry, so that he may get a job in a laboratory when he is released. I am collecting an equipment which I hope in time will be satisfactory. The state furnishes the men with tooth-powder, but not with tooth-brushes. They are also furnished tobacco, which is often the salvation of these men's teeth. It stains the teeth fearfully, but whether it is the tobacco or the mixture put into it, there is something that mummifies dentin, protects pulps and sterilizes the carious portion and often dead pulps to a certain extent, so that a great deal of suffering is prevented, as most all of the inmates chew tobacco.

The present warden has made a number of changes for the better recently. I used to do this work a number of years ago, and after an intermission I went back almost a year ago. The physician is becoming interested in this work and has helped me a great deal, and Mr. Collins, the state superintendent, although I have never met him personally to have any conference on our affairs, is also much interested, as I am told, and is in favor of the state lending some support to this work. He would be a good man to help us. He is a thorough student of these institutions in every respect, and he is very much interested in them. The convicts themselves are grateful, and they almost invariably thank me for what I do for them whether it hurts or not. As to time, I spend two whole days a week there. I have one morning each week for my call—*i.e.* emergency work—extracting and the relief of painful conditions. I am very much behind with the work and have nearly one hundred men on my waiting list now. It seems to be getting worse all the time—I do not know whether it is my fault or not, but the work and the number of men who need work seem to be constantly increasing. We need better equipment and facilities in many ways. Although I would lose my position, still I would welcome the appointment of a dentist under civil service regulations and with state support.

Dr. R. A. Wilbur, Elmira. I should like to express my appreciation of Dr. Belcher's paper, and at the same time correct a statement which he made in regard to the reformatory at Elmira. The state does furnish necessary relief to the patients there. There is a resident dentist who has charge of dental operations. He attends once a week, and the state pays him seventeen dollars per month for extracting. He also has the privilege of performing any operation on the inmates that they desire, if they can pay for it themselves. They receive wages from the state and also money from home, so that the dentist makes a little out of the operations he performs in the reformatory—but as far as the relief of suffering is concerned, the inmates *are* looked after. They can have teeth extracted when suffering, the state paying for that.

Dr. Belcher (closing the discussion). Something has been said in regard to the education of the public. I think one of the best ways to educate the public is through the magazine that I spoke about. Each month it will contain as good an article as we can get of educational value, and this will go to twelve hundred people every month.

I am glad to learn that the inmates have some dental attention at the institutions at Auburn and at Elmira.

With regard to charity work, I think we all do more or less charity work in our offices, but when it comes to helping the other fellow's charity, we do very little. One thing that has surprised me

in asking people for support, as we have done and expect to do, in order to raise at least three thousand dollars during the coming year, is that the Jewish people contribute very liberally to our charitable enterprise. They support their own charities and help others to support theirs. The small number of contributors who give one dollar is also surprising, and I assure you that to a man who is soliciting contributions a dollar looks very big. I know in my own case that when I have been asked to contribute to some other man's charity I have failed many times because I did not want to send five dollars, and was loath to send one dollar, thinking it too little; but in the future I shall contribute the dollar if I cannot give more.

I wish to thank the society for the kind reception accorded to my paper.

Dr. Belcher's paper was passed, and the President announced as the next item on the program a paper by Dr. L. M. Waugh, Buffalo, entitled "On Dental Caries."

[This paper is printed in full at page 420 of the present issue of the Cosmos.]

Discussion.

Dr. A. E. Webster, Toronto, Can. The historical portion of the very interesting paper to which we have just listened is more or less familiar to all of us. It is often well to review the work of the past, so as to obtain a correct view of the work of the present. In fact, consideration of the work of the past will often keep us from attributing the discovery of so many things to these modern times. For example, Robertson described tooth-decay with almost as much accuracy as if he had lived today. To cite another example, we are led today to believe the instruction to brush the teeth from the gum toward the occlusal surfaces of the teeth to be a modern idea, while as a matter of fact such instruction was given by dentists over a hundred years ago. You will find in the dental library in this city, in a book written by a dentist in Boston over a hundred years ago, a full and minute description of how to brush, rinse, and cleanse the teeth and mouth; this book contains as up-to-date instruction as is given by the best authorities of today. Let us review the literature, and not swell ourselves up so much in these days of the flying machine and the cast fillings; others before us may have accomplished something. For the sake of the future do not let us decry the achievements of the present. Encouragement and opportunity are the watchwords of this continent. Dr. Low is among those who have marked a milepost in the study of dental caries, and ought to be given greater opportunity and encouragement to satisfy himself that his discovery is as far-reaching as he would hope for.

The essayist uses the word *food* in the sense in which it is too often used when speaking of bacteria. Food is generally understood to be that upon which animals live, and soil or culture medium is that upon which plants live; thus speaking of the food of bacteria tends to encourage the idea that bacteria are animals, which is erroneous, and leads to a misunderstanding of bacterial growth and the cause of disease.

The essayist sets forth a feature of the history of dental caries which the dental profession might have repeated many times without doing any harm. As soon as it was demonstrated that caries was due to the presence of an acid in the mouth, the profession began to teach the public that the disease would not occur if the mouth were alkaline, not knowing that the plaque protected the acid of caries from the action of the alkali. It remained for Williams and Black to show how caries could go on in the mouth though the saliva were alkaline. It is now the duty of the profession to instruct the public not to depend upon alkalis for its prevention.

But the real mistake was made when we taught the public that caries was due to bacteria, and that if the bacteria were destroyed there would be no such condition; and that certain drugs, if taken into the mouth, would destroy the bacteria. How little we knew of the life-history of these minute plants when we

thought that we could destroy their cellular life and do no harm to the living tissues of the human mouth. Out of this false conception has grown a trade in mouth preparations worth upward of fifteen millions of dollars annually on this continent alone. It is up to the profession to correct this error, because no doubt much injury is being done.

As the author correctly says, future study must be one of bacteriology directed toward the microbic plaque. D. D. Smith's method is the most rational for all smooth surfaces of the teeth, but it cannot do much for defects of structure except perhaps in bringing about an immunity by raising the index of resistance. It is in this latter respect that Dr. Low's work ought to be of greatest value. The future must give us a method of either preventing the formation of the plaque or a means of its easy removal, and, as well, a means of preventing caries in defects.

The best we can do today is to remove the plaque by friction, change the environment of the teeth, and encourage those who have the ability and time and means to discover the means of prevention of the formation of plaques, and of caries in defects. In the past we have studied how to repair defects and tissue lost by disease, and in a measure how to prevent future tooth-disease, but we have paid little heed, as the author says, to prevention. Here is an aspect of this question of preventing dental caries which might well be emphasized. All operative dentistry aims to prevent caries at one stage or another, and in that sense is prophylactic, but the efforts of the dentists are only directed toward the teeth of those who consult them. What of the great majority of the public who do not see a dentist at all! There are fully fifty million people in the United States who do not see a dentist professionally during their whole lives. What does our present method of treating dental caries do for these people? Nothing. We have educated them to buy mouth disinfectants, but not how to prevent decays.

The essayist must be excused for having made but brief mention of the influence of mastication and foods on some functions, because he was dealing with the question from the dentist's standpoint. If we agree that friction will prevent the formation of the plaque, or rather prevent its remaining in position, it surely does not matter how the friction or the removal of the plaque is brought about, whether by the use of sand on a stick or sand in tobacco. Dentists haven't time to polish half of the teeth of the people of this continent, but they have the time to encourage those whom they do not see to eat such foods and to masticate them so thoroughly that their teeth will be protected against caries in many cases. They have time also to teach the public how to polish their own teeth on such surfaces as are exposed. No person properly taught should have labial, buccal, or lingual decay in his teeth.

Teeth that are polished every few weeks for the removal of plaques surely must lose some of their enamel at each polishing, and in the period of fifty years must become almost entirely worn away. I have a model here of a case where the prophylactic method was used on three of the teeth to prevent decay, but not upon the central because of the fear of removing a gutta-percha filling. This was done by the patient in eighteen months with less than two ounces of powdered pumice stone and a match. I told the patient that if the stain which I had removed from the teeth should appear again, it could be removed in the same way as I had done it, thus preventing decay of the teeth. They are not carious, but the dentin is exposed to the full length of the crown, and exceedingly sensitive. I mention this incident to put others on their guard with patients.

For a number of years dentists have used pumice stone moistened with H_2O_2 for polishing the surfaces of the teeth, or more frequently for the removal of stains. In many samples of H_2O_2 there is sufficient acid to decalcify enamel. Another method is to moisten the pumice with aromatic sulfuric acid, which later

discolors the teeth as well as decalcifies the surfaces.

Dr. F. W. Low, Buffalo. I would like to offer one more word, and that is suggested by the model presented by Dr. Webster. The whole enamel can be worn off with pumice. Dr. Head of Philadelphia made experiments, which he reported some time ago, as did Dr. Peck of Chicago, by which it was proved that the gum tissue at the cervix of the tooth can be so packed with pumice as to cause a recession of the gum. I do not believe that we should allow our patients to use pumice at all. I do not believe that we should use it ourselves except in special cases. I have after a good deal of persuasion induced the Buffalo Dental Manufacturing Company to put up in small packages a very fine flour pumice, and I use only that, and I believe that if we use that only once in a month or two and use it carefully, it is of great value. I use that flour pumice with a stick made of soft maple, shaped so as to resemble a spatula, concave on one side and convex on the other, so that it lies flat on the tooth instead of gouging into the gum like the end of a match. The teeth are cleaned only once a month in extreme cases by this method, and in the majority of cases once in three months, and I have yet to see the first case where I regretted the use of the floured pumice with the soft maple stick for prophylaxis treatment. To this Dr. Kirk bears witness, and I believe every one who has used the Smith method carefully will testify to the fact that the conditions of the mouth are very materially improved by careful and proper treatment by that method.

Dr. C. S. Butler, Buffalo. I wish to suggest a substitute for pumice which I find most excellent and superior in many ways to pumice stone—viz, the Ranier powder. This powder polishes the teeth beautifully, and I am inclined to think that even extensive use of it will not produce the abrasion that pumice does.

Dr. Low. Ranier powder is a powder which has been made for several thousand years, being made from pumice, which is the result of volcanic eruption, and if you examine it under the microscope you will see that the grains, instead of being rounded off by the grinding process, are as sharp as needles, and if used as constantly as the ground pumice, I believe it would destroy the enamel as rapidly. It does clean teeth beautifully, and if I dared I would like to use it in the place of fine-floured pumice, but I am afraid, for the reason that the crystals are sharper than those of floured pumice.

Dr. Webster. If a grit is not required, why should you use it? If you are trying to grind the pumice so that it is an impalpable powder, why do you need it at all?

Dr. Low. You can use a No. 1 sandpaper and get off quite a good bulk of the varnish of that door, but if you use No. 00 and if you persevere sufficiently, you can do as well as with the No. 1 or 2, and that is the reason I think we should look out and not do too much. I work the floured pumice into the little angles where the plaques are liable to form, and where the maple wood spatula reaches. By proceding from the palatal aspect to the center and from the labial aspect to the center, with a few passes you can take off the plaque, which is all that is necessary.

Dr. W. C. Wilbur, Corning. With reference to the use of pumice on wood. I have found that the ordinary wooden peg of the shoemaker is the best in handling pumice, and for getting it into the little angles that Dr. Low speaks of. It adapts itself perfectly, and is sufficiently hard to remove the plaques beautifully.

Dr. B. E. Luther, Batavia. One thought has occurred to me in this connection that I wish to express. The paper and the work done by the committee are commendable, and it is an excellent thing to try to take care of the teeth of the present generation; but one thing occurred to me from hearing Dr. Waugh's paper and the discussion by Dr. Low with reference to caries in the primitive races. It is undoubtedly true that the primitive races suffered from caries, but caries did not exist in such proportion in them as it does in people of today.

We know by the examination of skulls of the primitive races that the degree of caries was very slight. Would it therefore not be well to make some investigation as to why the primitive people did not have so much caries, and try to go farther back, and get at the real cause of caries and see if it cannot be eliminated?

Dr. G. W. PRINGLE, Niagara Falls. In reference to what Dr. Butler said about Ranier powder, I have a patient who claims—and I have no reason to disbelieve him—that for the past three years he has used this powder continuously, and his teeth have certainly been in a much better condition from that time on than they were before, and I can see no indication of the teeth wearing away owing to the use of that powder.

Dr. ROBERTS, Buffalo. I am at a disadvantage in discussing this subject, inasmuch as I am not a dentist, and do not understand the really technical portion of the tooth plaque. I have only studied the subject from a scientific point of view.

Anyone who has done scientific research work knows of the difficulties attaching to an investigation of this kind. We started with trouble from the very first. In the first place, the medium in which the micro-organisms were grown had to be taken from a young lamb, and I hunted a long time before I could secure a young lamb, and could find a butcher who would cut it immediately after it was killed—as the meat had to be taken while it was warm. However, through my efforts, and with the assistance of Dr. B. P. Wende of the United States Bureau of Animal Industry, I managed to secure a little lamb about as big as a cat, so small that we had difficulty in getting a pound of meat off the bones after it was dressed—so you can guess the size of the animal. In order to make broth from this meat it had to be mixed with spring water, and then had to be sterilized or pasteurized for five hours for three successive days. I am not particularly fond of getting up early, but in order to secure the lamb, have it killed, and have the meat sterilized for five hours the same day, I had to get up pretty early in the morning. However, I succeeded in securing the medium, and of all the tubes, one hundred and sixteen of which were inoculated, and probably a dozen or more were kept without inoculation, not a single one was spoiled, which I think was pretty good.

I do not think that Dr. Low is doing his theory justice, in that he is not speaking strongly enough for it, and I will explain why. In making the sulfocyanate test, we first of all made a two per cent. solution in distilled water and dropped that in with a specially made dropper, until we managed to get the tint with ferric chlorid solution equal to 3 or 4 of the color scale. We knew that the conditions that existed in the tubes were quite different from the conditions in the human mouth, and that explains why three tubes in which sulfocyanate had been placed showed dental plaques, but there were only one or two plaques in the tubes—one I think had one and the other two, and the rest none at all. We were very fortunate, for I must say that when we started I was told that we might get one or two or three tubes to show plaques—but we got twenty-one in all, so you see we did pretty well.

The spring water we used came from Williamswell, N. Y., and was highly charged with calcium carbonate. We wanted to work with that because the formula of the medium stated that we must have spring water, I suppose in order to furnish the calcium salts for the calcification of the plaques.

When the medium was made and inoculated, we began to look for the tubes with plaques in them. Without the microscope we first were somewhat confused between the appearance of the crystals of calcium carbonate and of the plaques, but after a little microscopical experience we were readily able to tell without any difficulty the difference between the crystal and the plaque by the naked eye, because the plaques were round and the crystals were sharp and angular.

If I were to repeat these experiments,

my suggestion would be to try to have the plaques form on a glass slip instead of on the side of a tube, because the surface of the tube was rounded, and when we would break one and stain it, in attempting to focus it under the microscope we would get only one small portion into focus. When you try to break a test tube it always breaks in the wrong place, and the break generally runs through the plaque and you have a poor specimen. An improvement on this, I think, would be to use slips of glass smaller than the tubes, and get the plaques deposited on them so that you would have a flat surface of glass, which could be readily put under the microscope for examination.

Moreover, I think the formula of the medium was not perfect. The formula called for the sterilization of the medium at a temperature not exceeding 75° C. for five hours; after the sterilization the albumin in the medium coagulates and leaves a deposit, and in order to avoid this the medium should in my opinion be first sterilized in small flasks for two hours at 75° C. and then filtered through paper and put in the tubes, in that way giving a clearer fluid to work in.

In our experiments we were greatly pleased with Dr. Low's fervid enthusiasm, and it was gratifying to us to know that his theory had to a great extent been borne out in this experimental work.

Dr. Waugh (closing the discussion). I am very much gratified by the discussion. Usually work of this character can only be presented to a general audience in the shape of results, and very little interest is shown in the means of reaching these results. While, after all, science is only valuable as far as it may be applied, yet the growing interest which seems to be taken in the means by which these conclusions are reached is very pleasing. Dr. Low, of course, is simply bubbling over with enthusiasm, and the experiments we have made tend to confirm his theories. His study of this question has been made by observation only, and while the clinical aspect may sometimes tend to show certain facts, the theoretic aspect may not confirm them—but, as I say, the experiments made by us seem to confirm his theories on this work.

I say in my report that I appreciate the fact that it is wise for me to be guarded in my statements, because we may be misled; these things may not be what they seem, and we may be after all mistaken; so we are more guarded in what we say with reference to proving that which Dr. Low advocates than in what we really think about it.

Dr. Roberts expresses my sentiments when he says that Dr. Low is too modest in his claims, and that the experiments are more emphatic than Dr. Low says they are. Dr. Low must be given credit for demonstrating the fact that the value of the prophylaxis method in the prevention of caries is due to its mechanical effect, that is, to the prevention of the growth of the plaques and their removal.

The committee knows that there are other constituents in the saliva aside from sulfocyanid which have an influence on the plaque, and having devoted time to demonstrating the presence of the plaque and the influence of sulfocyanate on it, is now ready to work on other elements. Dr. Low speaks of the influence of glutin and mucin and other agents, as well as sulfocyanate. This is a large field for exploration, and we have to proceed a little slowly. The work will require the efforts of a great many men for a number of years from different points of view, and *then* there will be more to learn. The constant changes in the saliva and the constant changes of the conditions, whereby we have so much to contend with in order to determine what conditions favor the plaque, are problems to be solved.

Speaking of abrasive powders, I remember reading a statement by Dr. Darby in which he said that it had been his practice for years, since his children were all small, to take fine strips at stated periods and pass them between the teeth of the children of his family; and while they are all grown now, he finds that in the mouths of some of them there are only one or two or three fillings, all of which are on the occlusal surfaces. So

the question of the kind of abrasive powders to be used is important, yet, if we work judiciously, we need not fear any abrasion of the enamel surfaces. I appreciate the necessity of good judgment, yet I do not think we need to hesitate because of the danger of polishing. Dr. Rogers of Detroit told Dr. McCall of an unusual experience that he had with a patient during the grape season. He said that in a period of one month the enamel had become considerably cupped out. On questioning the patient he found that she ate a great many grapes, and his conclusion was that the acid action of the grapes, together with the friction on removing the seeds from the mouth, had caused the trouble.

I agree with Dr. Webster most emphatically in condemning the promiscuous use of so-called mouth-washes. We know that they contain many constituents of widely different qualities and actions, and when we prescribe general mouth-washes we should be careful that there are no dangerous ingredients in them. For example, we know that alcohol constringes the gums and makes them harder, and my practice is to leave the alcohol out. I have recently employed simple cinnamon water. Dr. Kirk some years ago showed that cinnamon water was much more effective as an antiseptic than many of the very popular mouth-washes. The plain cinnamon water as we get it from the druggist, if diluted one to three in water, gives us a useful antiseptic. I have used this for nearly a year in our infirmary, and nothing else has ever been so universally liked. It is a cheap and efficient mouth-wash.

Dr. Luther speaks of caries not being so prevalent in the teeth of the older races. I could refer Dr. Luther to some statistics on this subject that would enlighten him. Mr. Mummery of England, in his studies of diet and its relation to caries, mentions two races in South America, one of which was strictly a meat-eating people, while the other was a farming people living on a mixed diet. He found that in the case of the meat-eating people the proportion of caries was six or seven per cent., whereas in the people who used a mixed diet the percentage of caries was nineteen or twenty. So the character of food used is important in this connection. In all probability the food habits of primitive peoples were quite different from that of the people of today. There are a great many factors which we must take into consideration when we attempt to determine the reason for the wider spread of caries of today than that which was present in the primitive races.

The meeting then adjourned until Friday evening.

(To be continued.)

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

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PHILADELPHIA, APRIL 1910.

EDITORIAL DEPARTMENT.

COMMERCIAL PHILANTHROPY.

THE *Dental Digest* in its issue for February prints a carefully considered, well-written, and courteous criticism upon an editorial entitled "Dentistry and the Public Service" which appeared in the January issue of the DENTAL COSMOS. It does more,—it republishes the major portion of the COSMOS editorial to certain features of which its editor takes exception. The Editor of the DENTAL COSMOS salutes his *confrère* in acknowledgment of the compliment which the *Digest* thus pays to the importance of the issue which the COSMOS has raised.

There can be no doubt as to the importance of the main question, the *public service relations of dentistry*. All are agreed that a world-wide activity of interest is being awakened in the extension of proper dental service to that large proportion of humanity which has not heretofore been able to afford its benefits. All who have paid attention to the matter are also agreed that the

recognition of the importance of oral hygiene in relation to public health is growing by leaps and bounds, so that a demand for expert dental service is being created at a rate which bids fair to outrun the means for adequately meeting it unless active measures are taken to increase the present sources of such required service. All these things are matters of common knowledge among those who keep in touch with the signs of the times in so far as they relate to dentistry—which doubtless the great majority of its practitioners do. Therefore, as to the foregoing we have no difference of opinion with the *Dental Digest*, nor has it with the DENTAL COSMOS so far as we are able to discern.

The editor of the *Digest* contends that there is a vast amount of ignorance upon the part of the public concerning matters dental, and the possibilities of dentistry as a prophylactic against disease. He instances the high rate of infant mortality and the physical inefficiency of adults resulting from ignorance of oral hygiene as examples of the need for more knowledge of the possibilities of dental service as a preventive of bodily disease. Here, again, no one whose opinion is entitled to respect would disagree with him. He points to the fact that 97 per cent. of school children have defective teeth, leading to physical defects, stunted growth, and early death—which he says is "because no one has taught them to care for their mouths or taught their parents to see that they were cared for"; that—

> About 8 per cent. of our public have adequate dental attendance. Approximately 35,000 dentists serve this 8 per cent. and live in all stages of poverty to affluence, with by far the greater number indifferently well off. And all about us approximately seventy million people suffer and die because we, who alone can teach them, do not. These are the actual conditions after practically two generations of teaching and leadership by the colleges and societies. Will anyone say, in the face of them, that our leaders have led us well in this respect? In many ways they have done marvelously well, but in the spread of this almost priceless information are they entitled to our plaudits?

Whew! Will the editor please excuse us for a moment until we catch our second wind and get the dust out of our eyes? The awful responsibility involved in the sufferings and death of seventy millions of people "because we, who alone can teach them, do not," simply staggers us. It puts the great white plague out of business!

But the editor of the *Digest* is, we think, unintentionally un-

just to the dental profession. The 35,000 dentists who "in all stages of poverty to affluence" serve the 8 per cent. of enlightened residue of the population of the United States in a dental way, learned what they know anent the "priceless information" mainly from "the colleges" and "the leaders," who in this case as in most others are made the scapegoats for whatever charges of ignorance or shortcoming are from time to time brought against the dental profession or its members. But these 35,000 dentists, it is fair to assume, have in their own interest and upon all favorable occasions been passing-on the "priceless information" free of charge to any or all who were willing to take it. There has been no lack of effort, as we view it, upon the part of the dental profession to make the benefits of dental service known to the public. The editor of the *Digest* looks at but one side of the case. It is one thing to propagate information; it is another thing to utilize it and act upon it. We have had the Ten Commandments for possibly six thousand years, and during that period of time they have been assiduously propagated as ethical precepts, and this also priceless information has even been enforced by the pains and penalties of the law; but still there may yet be found those who lie and steal—or even those who, like Private Mulvaney, are inclined to "put their fut thru ivry bloomin' wan av thim betune lights-out to revilly." So we are rather strongly of the opinion that lack of knowledge of the benefits of oral hygiene exists not so much because the dental profession do not teach the public, but because the public has been unwilling to give ear to the "priceless information."

A variety of circumstances have brought about changed conditions with respect to this matter, and it is unnecessary to analyze them in detail. Mainly, public attention is being drawn to oral hygiene because of the various educational campaigns which are emphasizing hygiene in a general way, and enforcing the necessity for better health conditions. Thus one of the ways in which "our leaders" have "done marvelously well" is in scientifically investigating the relations between mouth hygiene and bodily health, thereby evolving a kind and amount of "priceless information" which was truth-compelling and convincing in character, the promulgation of which has commanded respectful attention as well as action upon the part of the public.

The editor of the *Digest* thinks that whatever has been done in the education of the public is the result of individual and not of organized effort. The point is of minor importance; the fact remains that the awakening has come from efforts originating in the professional ranks, and what is of still greater importance to the present contention, it has not come through the agency nor efforts of the dealer in or manufacturer of dental supplies. If organized dentistry has not cultivated and stimulated the barren soil to the point where it is ready to produce results, and if the present public interest in the question has been the outcome of other causes, one thing at least is certain, and that is that the distinguished honor does not belong to the commercial enterprises engaged in the dental supply business. The editor of the *Digest* refers more than once to the financial difficulties with which some dentists have to contend, and says, "A large proportion of the dentists practicing in the United States today have been 'set up' and are in no small degree 'carried' by the finances of the Dental Trade." We haven't the slightest doubt of it,—and for various reasons: First, because there are dentists who, like a large portion of the human family, buy more than they can pay for; and second, the competition in "dental trade" has developed the tendency to sell a man more than he can pay for, upon terms that ultimately make it necessary for "Dental Trade" to "carry" the overloaded victim or lose the money that has been invested in him. The Editor of the DENTAL COSMOS happens to be in position to witness many instances of the demoralizing effect of this overloading and subsequent carrying of new graduates by "Dental Trade," the end of which has been loss of credit, loss of self-respect, and chronic dead-beatism upon the part of the unfortunate and misguided victim. If the carrying system has benefited some, it has not been without evil results to others, and in both instances it comes distinctly within the limitations of "practical" business which the *Digest* regards as characteristic of our age. Therefore let us be practical in the present instance, and consider the relation, if any, that "Dental Trade" shall properly bear to the propaganda of oral hygiene and the public service relations of dentistry, which is the essence of this discussion.

The *Digest* defines its position on this question with a fair amount of clearness. Its editor says, in regard to the "financing

of certain undertakings for the *good of the profession*, which the society was unable to undertake"—

> When the profession has risen to its full stature, when from its own resources it is meeting these demands that are now too great for its interest, but not really too great for its purse, those members of The Dental Trade who contributed to the early stages of the work will retire into that obscurity from which they temporarily emerged, well contented to have lent a helping hand when one was needed.

This puts a new phase on the question at issue. The reason why "The Dental Trade" has financed the undertaking is not because of insufficient resources upon the part of the dental profession, but of insufficient interest. It is said that good wine needs no bush, and it is equally true that truth needs no such diaphanous garment as the editor of the *Digest* has woven to conceal its nakedness. The real reason why "The Dental Trade" is intensely and, as it now appears, financially interested in this public dental educational movement is because of the hope and belief entertained by the said "Dental Trade" that the success of the propaganda will eventuate in largely increased sales of its wares. That is the figure of truth over which the editor of the *Digest* has thrown the transparent garment of philanthropy which he has so ingeniously woven for the purpose of hiding certain aspects of it which would not look so attractive in the nude state.

Let us make no mistake or have any misunderstandings about this important matter. The relations of dental trade and the dental profession are such that they are interdependent, but there should be no confusion of ideas as to the prerogatives of each. If the dental trade desires to contribute financially or in other material ways, or morally, to the propaganda of oral hygiene, there is no reason why it should not and very good reasons why it should do so. But that it should in any degree become the propagandist were not only to go beyond its legitimate sphere of action, but would constitute a trespass upon the prerogatives of the dental profession, and one which should be discountenanced and resented as such.

The lines are easily drawn. It is quite conceivable that a concern engaged in the manufacture of bibles and prayer-books might want to contribute to the work of foreign missions because the propaganda of Christianity among the heathen would increase

the sales of bibles and prayer-books, and as a consequence also the income of the concern that published them; but it is scarcely conceivable that a church organization would be willing to permit the commercializing of its effort to spread a knowledge of the gospel among the heathen to the extent of allowing the agent of a publishing house to undertake the propagation of Christianity in the foreign missionary field, especially if the avowed motive of such an agent was to increase the sales of bibles and prayer-books.

We have endeavored to discuss this matter in as temperate and as considerate a manner as it has been done by our esteemed contemporary. If anything here said has disturbed the even temper of his mind we trust that the disavowal of any such intent upon our part will have the same effect upon it as the glycerin-and-water treatment for hardened moldine which he prints at another place in his February issue, *i.e.* restore it to its "original placidity."

Correction.—In Dr. G. V. Black's reply to Dr. Fenchel, in our February issue (see page 203, last line of first column), for "amalgams made from filings *and* unalloyed silver and unalloyed tin," read "amalgams made from filings *of*," etc.

BIBLIOGRAPHICAL.

A Compend of Histology. By Henry Erdmann Radash, M.S., M.D., Associate in Histology and Embryology and Demonstrator of Visceral Anatomy in the Jefferson Medical College; Adjunct Professor of Physiology and Instructor in Histology in the Pennsylvania College of Dental Surgery. Second Edition, revised and enlarged, with 107 illustrations, 350 pages, and index. Philadelphia: P. Blakiston's Son & Co., 1909. Price $1.00 net.

The usefulness and popularity of Blakiston's Quiz Compends is amply evinced by this second edition of Dr. Radash's book, which among the great number of compends and text-books on histology recommends itself by its clear and concise make-up, that has been secured without any sacrifices to completeness. The inaugurative chapter on technics gives full instruction in routine histologic and pathologic work, also the chapters on embryology form a good and sufficiently solid basis for intelligent study of the subject in view. The tissues, systems, and organs are grouped in a simple and at the same time characteristic manner, and the subjects of the histology of the tooth and the development of the

face and teeth have received specially careful consideration. In the selection of his illustrative material, which is abundant, the author has seemingly striven less for originality and great variety than for typicality, which is always appreciated by the student who is looking for a reliable guide, and for whom this volume is chiefly intended.

Die Technik der Harnuntersuchung und ihre Anwendung in der Zahnaerztlichen Praxis. [Technique of Urinalysis.] Ein Leitfaden zum Selbstunterricht fuer Zahnaerzte und Studierende. By Georg Guttmann, Practicing Dentist. 87 pages, with 12 illustrations and 3 colored plates. Berlin: Hermann Meusser, 1909. Price, *M.* 2.75.

The recent advance in systemic diagnosis and treatment of dental diseases, and the close affinity between internal medicine and dentistry are authenticated in the present little volume, which in a convincing manner proves the necessity of a knowledge of urinalysis for the dentist, and provides a brief but none the less reliable guide in the technique of urinalysis even for the entirely unskilled. The author treats on the normal constituency of the urine, its pathological constituents and their demonstration, the discovery of drugs and sediments in the urine, and finally discusses the value of urinalysis in dental practice, on the principle that no case of pyorrhea alveolaris should be treated without previous urinalysis. A superabundance of information is carefully avoided, though no essentials are lacking, and every truly scientific dentist, though he be already familiar with the import of this comparatively new branch of investigation from an attentive perusal of dental literature, will welcome this epitome. For the diagnosis of diabetes mellitus from pathological symptoms in the mouth, the opinions of numerous German authorities are uncritically cited. In the second part of the book, as well as in the bibliography, we miss references to the great work of American authorities in this field, who have for years pleaded for the general adoption of urinalysis in dental work, and have designed a technique fully as efficient, to say the least, as that propounded by Guttmann. Despite these limitations this handsome little book deserves a place in every progressive practitioner's library as a *résumé* of the work so far accomplished in a comparatively novel field of scientific dentistry.

Anatomy and Histology of the Mouth and Teeth. By I. Norman Broomell, D.D.S., Dean and Professor of Prosthetic Dentistry, Dental Anatomy and Histology, Dental Department, Medico-Chirurgical College of Philadelphia, and Philipp Fischelis, M.D., Associate Professor of Histology and Demonstrator in Embryology, Medico-Chirurgical College of Philadelphia. Third Edition, revised, 454 pages and index, with 357 illustrations. Philadelphia: P. Blakiston's Son & Co., 1909. Price, $3.00 net.

The previous editions of this work, which have been reviewed at length on page 1051 in 1898 and page 1200 in 1902, have again been added to, making the present (third) one still worthier of the approval accorded to its predecessors. The general plan of the work has not been altered, but substantial additions have been made to Part II, Chapters I, II, VII, etc., facilitating for the student and graduate of dentistry the collateral

reading of anatomy, histology, and embryology, which heretofore had to be gleaned mainly from extensive text-books on these subjects. Recognizing the necessity of coherence in such studies, the authors have included a description pertaining to general cytology, general embryology, and histogenesis, and a further presentation of the significance of the facts thus gained for an intelligent understanding of the formation of the organs of the mouth. In the description of the teeth, the terms "superior" and "inferior" have been changed to "upper" and "lower," and the term "palatal," as applied to one of the tooth surfaces, has been discarded, and the word "lingual" substituted. The illustrations for the newly added or enlarged chapters have been very judiciously selected, and the original photographs, made from histologic sections prepared by the authors, which illustrate Chapter VII are masterpieces of perfection. A small reduction in the size of the print and a new and more handy style of binding mark another improvement in the mechanical excellence of the work. If we were to select a "Five-foot Dental Library," for the dental student and practitioner, this book would be among the first to be enumerated. R. H. R.

REVIEW OF CURRENT DENTAL LITERATURE.

[*L'Odontologie*, Paris, November 15, 1909.]

APPLICATION OF THE CASTING PROCESS IN A COMBINED PIN AND TUBE TOOTH ON A BICUSPID WITH DIVERGING ROOT-CANALS. By Dr. L. Bruschera.

The author describes a process for reinforcing the retention of crowns on teeth with very diverging canals, which is usually unsatisfactorily accomplished by employing a single pivot or one pivot reinforced by a short post fixed in the orifice of the other root-canal. Not wishing to apply a banded crown on an upper right first bicuspid with widely diverging canals (Fig. 1), he selected a tube tooth. The canals are treated after one of the standard methods, and the apices sealed with a little cement. With a round bur a round box is cut around the orifices of the canals and with a cylindrical bur given rectangular shape, the borders being polished so as to be absolutely flat (Fig. 2). The largest canal, which is usually the anterior one, is enlarged with reamers without too much weakening of the walls of the root. The orifice of the other canal is enlarged only to a depth of 2 mm. The pivots of iridio-platinum or gold of suitable gage are selected and introduced in the canals, the larger one protruding beyond the

Fig. 1.



Fig. 2.

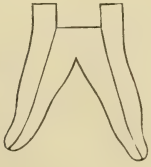


Fig. 3.

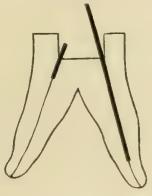
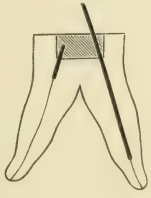


Fig. 4.



level of the surface of the root, the small post just protruding into the artificial box-like cavity (Fig. 3). Both pivots are withdrawn, and the cavity is filled with inlay impression wax. The heated pins are driven to place by means of pincers and a plugger, the contours and surface of the wax are smoothed (Fig. 4), and the wax is cooled and withdrawn, together with the posts. After trying in once more for the sake of control, the wax is invested, melted out, and the inlay cast after approved methods, the sprue wire having been fastened about parallel with the protruding long pivot on the other end of the upper surface of the wax model. After the inlay is cast, the protruding pivot is cut off, the inlay is fitted to place with taps of a mallet, and withdrawn.

FIG. 5.

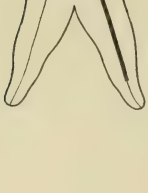


FIG. 6.

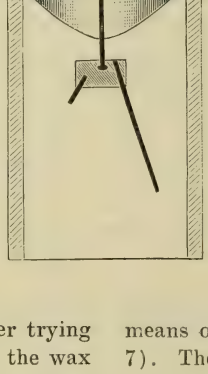


FIG. 7.



On the surface of the inlay some fissures are made to aid in the proper adjusting of the inlay in the plaster impression. The inlay is then put back to place and a plaster impression taken, which if broken can be accurately assembled by means of the fissures made on the surface of the inlay (Fig. 5). In order to facilitate the removal of the inlay together with the impression, the pivots are oiled. The plaster model is then cast, and the tube tooth is adjusted and ground to accurately fit the plaster model. By means of a point passed through the tube of the tube tooth, the exact spot where the sprue wire is to be fastened later on may be marked on the inlay. At this spot a hole is burred into the inlay by means of a round bur. The hole is filled with sticky-wax, the tube tooth set on the inlay, and the hot sprue wire is introduced through the tube into the hole in the inlay. After cooling, the sprue wire is gently withdrawn. After trying once more, the inlay is invested in the casting ring, the wax in the hole in the inlay is burned out, and the molten gold is forced into this hole, posts, inlay, and pin forming one solid piece after this final casting (Fig. 6). The tube tooth is then fastened to the inlay by means of cement and the pin is riveted (Fig. 7). The whole piece may then be fastened to the root after an approved method.

[*New York Medical Journal*, New York, January 1, 1909.]

THE SURGICAL MANAGEMENT OF COMPLICATED HARE-LIP AND CLEFT PALATE. By Dr. J. B. Roberts.

In a child born with hare-lip and cleft palate, the author recommends what he calls the composite method of treatment: (1) Immediately after birth the mother should press the two halves of the upper jaw together firmly with her fingers two or three dozen times a day. This orthopedic procedure tends to lessen the width of the fissure. (2) As soon after birth as possible, the soft and semi-cartilaginous bones of the upper jaw should be forced together by means of a Hammond clamp or the more formal operation of Brophy,* with wire tie-beams and

* See DENTAL COSMOS, April 1901, p. 317; also G. V. I. Brown, "The Surgical and Therapeutic Aspect of Maxillary Readjustment, with Special Reference to Nasal Stenosis, Hare-Lip, Cleft Palate, and Speech," DENTAL COSMOS, January 1909, p. 7.

lead plates. (3) About the same time that this replacement of the bones is attempted, the alveolus should be reconstructed in front, if there be any great deviation in the alignment. (4) Any protrusion of the intermaxillary bone must next be corrected by a plastic or osteoplastic operation at the front part of the septum of the nose. (5) Any gap remaining in the roof of the mouth must next be closed by a flap operation. (6) A fissure in the upper lip must be closed by carefully applied sutures, and the deformity of the nostril must be corrected. (7) If the lower lip is conspicuously prominent, a V-shaped piece must be excised, and perhaps the upper lip widened by insertion of tissue from cheek, chin, or hand. These various operative steps will occupy probably a year or two, because many periods of inactivity will be demanded in order to insure safety to the child and to permit the surgeon to see the effect of the various stages in the operative work. After the flap operation for closing the palate cleft, great care must be taken to keep the parts clean by flushing out the nose and spraying the palate with weak Dobell's or normal saline solution. The patient may be kept quiet by small doses of chloral and paregoric. Some operators feed by the rectum, others put food in the stomach by means of a small tube introduced through the nose. Feeding may also be accomplished by the mouth with liquid food. The suture wounds are kept moderately clean by spraying and swabbing.

In adult cases, the author uses obturators, feeling that cleft-palate operations are almost uniformly unsuccessful. The modern improvements in the operation, however, are convincing of the fact that plastic reconstruction of the palate is better than mechanical obturators with a movable velum. Patients should be subjected to operation early enough to have a fair reconstruction of the parts before they begin to talk.

Careful training in speech will greatly increase the mobility of the palate muscles and the superior constrictor of the pharynx. In addition to the benefit to speech, the early closure of the roof of the mouth will probably save the child from infections of the throat, nose, and pharynx, and secondary inflammation of the middle ear.

[*Proceedings of the Royal Society of Medicine*, London, December 1909.]

SOME OBSERVATIONS ON THE BACTERIOLOGY OF PYORRHEA ALVEOLARIS, AND THE TREATMENT OF THE DISEASE BY BACTERIAL VACCINES.

By J. W. Eyre, M.D., and J. Lewin Payne, L.D.S.

After summarizing the results of the investigations into the bacteriology of pyorrhea alveolaris as carried out by Simms, Goadby, and Washbourn, the authors give a report of their experiments, during which their attention has been restricted to the micrococci that developed upon the nutrient media which had been sown with the pus from tooth-sockets. They isolated from pus of pyorrhea cases the following organisms that were regarded as the responsible bacteria: Micrococcus (staphylococcus) pyogenes aureus in 2 cases, micrococcus catarrhalis in 9, micrococcus catarrhalis and streptococcus pyogenes longus in 11, streptococcus pyogenes longus in 7, streptococcus lanceolatus pneumoniæ (pneumococcus) in 4 cases.

The following procedure was adopted in the preparation of the vaccines, which were subsequently used in the treatment of cases. The culture intended for the preparation of a vaccine was always made upon nutrient agar, except in the case of the pneumococcus, which was invariably planted upon blood agar, and incubated for twenty-four hours at 37° C. After examination of the growth in order to determine its purity, it was emulsified in the tube in which it was originally grown, with some 5 ccm. of 0.1 per cent. saline solution. It was then transferred to a sterile test tube, already provided with sterile glass beads, and placed in an electric shaker for ten minutes. The enumeration of the organisms present in the emulsion was carried out by means of Wright's method, in which equal volumes of the emulsion and normal human blood are mixed, spread as a blood film, stained, and the ratio between red cells and bacteria worked out. The emulsion was then killed by exposure to a suitable temperature in a water-bath, and a portion of it diluted with 0.25 per cent. tricresol solution, until each cubic centimeter contained 100,000,000 bacteria. Further dilutions were then made, and

separate doses corresponding to five, ten, fifty, or one hundred millions, etc., were put up, each in a small sterile glass bulb and sealed ready for use.

As a preliminary treatment the mouth was mechanically cleaned, the teeth were scaled, and the pockets washed out with an antiseptic, such as formaldehyd 10 per cent., hydrogen dioxid, tincture of iodin, copper sulfate, etc. These necessary measures occupied the interval between taking the cultivations and the first injection of vaccine.

When vaccine treatment had been commenced, a mouth-wash was prescribed, either of formaldehyd 0.2 per cent. or hydrogen dioxid 5 to 10 volumes. This was given rather with the idea of directing attention to the condition of the mouth, and to impress upon the patient the desirability of washing away the excess of pus. In addition to these measures and attention to general health, vaccines prepared from the organism actually obtained from the pus in each case, that is to say, autogenous vaccines, were systematically administered by subcutaneous injection into the abdominal parietes—the size of the dose and the intervals between the doses being controlled, in the earlier cases, by the movements of the index, which represented the patient's resistance to the organism employed in the vaccine, and in the later cases by direct clinical observation of the affected tissues. Rapid improvement was noted in most of the cases; some, however, were distinctly more resistant to treatment. The general impression was that the success of the treatment is influenced by the etiological factor, in other words, the responsible bacterium in each case. Pyorrhea due to micrococcus pyogenes aureus yields most readily to treatment, next that due to the pneumococcus, then comes that due to streptococcus pyogenes longus. More troublesome is the pyorrhea due to micrococcus catarrhalis, and most intractable of all, that due to a double infection with micrococcus catarrhalis and streptococcus longus. In many cases a cure was effected, that is to say, mastication became possible without any pain, the teeth became firm, the mouth comfortable, no pus could be expressed from the sockets, and the general ill-health—in particular, arthritic (rheumatic) pain—disappeared. The recession of the gums, if at all marked, is associated with loss of bone, a condition which no amount of treatment of any kind is able to remedy. In the few cases that presented again upon request for a control of permanence, this cure had lasted in 7 from twelve to fifteen months, in 12 from nine to twelve months, in 2 less than nine months, and 4 cases were only improved.

[*Deutsche Monatsschrift fuer Zahnheilkunde*, Berlin, November 1909.]

A METHODICAL USE OF ARSENOUS ACID IN THE PAINLESS DEVITALIZATION OF THE PULP.

By Dr. M. Lipschitz, Berlin.

A review of the universal dental literature on devitalization of the pulp by arsenous acid since its introduction by Spooner in 1836 is offered, and a method for the painless devitalization as evolved by eighteen years of clinical experiments is suggested, as follows: A pellet of cotton saturated with concentrated carbolic acid is laid on the exposed pulp, if it has been possible to expose the same, for at least ten minutes. The effect of the arsenous acid is painless only if an arsenous paste thoroughly mixed with carbolic acid is applied. In exposed pulps this paste is brought into direct contact with the pulp. The paste is applied on cotton, and sealed in the cavity very carefully and without exerting pressure. The greater the volume of the pulp the more paste is required for devitalization. The arsenous paste should be left in the cavity for a certain definite time, which is determined by the kind of tooth and the size of the pulp. If the paste is left in a tooth with a large pulp for over two and one-half days, danger of periodontitis arises. The greater the surface upon which the paste can exert its action, the more quickly the devitalization of the pulp will take place. The action of the arsenous acid is a gradual one by way of necrosis of the tissue. The differential diagnosis between simple acute pulpitis, acute purulent pulpitis, acute gangrenous pulpitis, and chronic granulomatous pulpitis is of great importance for the correct application of the paste. Dr. Lipschitz' formula for arsenous paste is:

℞—Acid. arsenic.,
Cocain. hydrochlor., āā 1.0
Acid. carbol., q.s. to make a soft paste.

[*Lancet*, London, December 25, 1909.]

THE VACCINE TREATMENT OF PYORRHEA ALVEOLARIS (ALVEOLAR OSTEITIS). By Kenneth Goadby, London.

For the general purpose of description the cases of suppuration of the alveolus of the jaw may be divided into two classes: (1) Those which exhibit some constitutional disturbances, referable to (*a*) intoxication and (*b*) direct bacterial invasion, and (2) those showing no constitutional disturbances of a definite type, but which have from time to time various minor pathological manifestations about the oral mucous membrane.

Four distinct phases of alveolar osteitis are to be recognized; it is quite possible that these constitute two different disease entities.

Type 1. The gums and the teeth appear perfectly normal. Here and there slight depressions may be noticed between individual teeth, and careful examination in these regions will exhibit the presence of a certain amount of pus, sometimes only to be recognized microscopically, showing that the interdental bone has already become affected, and a photograph shows distinct loss of the bony tissue.

Type 2. The condition is characterized by easily bleeding gums which are slightly detached from the teeth; there is a great increase of interdental space with loss of the interdental bone, which becomes softened.

Type 3. The hypertrophied gum noted in the second type for the most part becomes shrunken, but there is marked injection of the vessels passing up from the buccal surfaces; the bone in various directions has become removed, not only between the teeth but in the anterior and posterior surfaces of the alveolar plate. Patches of osteoporosis or rarefying osteitis are scattered about the alveolus, and in many instances the bone has become so thinned that a fine-pointed probe or hypodermic needle may be passed right through the jaw almost at the level of the roots of the teeth, with little more opposition than when passing it through a thick towel. The infected mucous glands are also seen near the infected areas.

Type 4. The teeth are all loose in their sockets, the alveolar process has become absorbed, the gums are boggy, sinuses may be found here and there in the mouth, and as a rule, marked fetor of the breath is present. The fetor of the breath may be an early or late symptom, and depends for its presence on the special type of organisms. It is particularly foul when the bacillus necrosis is present, and has a sweetish-sour smell in the presence of the saccharomyces neoformans.

The methods adopted in dealing with the cases have been: Microscopical examination of the films made from the pus, leucocyte, and blood count, estimation of hemoglobin, and differential blood count. The films were stained after Gram's and Leishman's method. The organisms present on the films vary enormously, and the following bacteria are recognizable by their morphological forms: Leptothrix racemosa of Vicentini, the bacillus fusiformis, the three varieties of mouth spirochætes, a large number of organisms belonging to the diphtheroid group, diplococci, streptococci, strepto-bacilli, and yeasts. A very large number of the morphological forms, some of them often classed as leptothrix, have also been found; one organism is sometimes present, a bacillus generally occurring as diplo-bacilli, anaerobic in habit, growing out into long threads in liquid media, and producing a very large amount of evil-smelling gas, which may be classed as the bacillus necrosis. In the films stained by Gram's method the leptothrix racemosa retains the stain, as do some of the diphtheroid bacilli, some of the cocci, and the yeasts; the other organisms decolorize.

Agar streaks were made from the pus, under the usual precautions to eliminate adventitious forms, and wherever possible from an extracted tooth; the organisms were plated out, and the individual bacteria isolated and tested on the usual cultural media. A large number of organisms were isolated, but in order to determine the particular infecting organism in the individual case, recourse was had to the method of the opsonic index originally described by Sir Almroth Wright. The various bacteria in each case which gave an opsonic index either considerably above or considerably under normal were presumed to be causal agents of the disease.

The bacteria isolated and determined in this manner were streptococci of the longus type belonging either to the streptococcus fæcalis or streptococcus angiosus groups of Andrewes and Horder. The pneumococcus

was found at times, but the staphylococcus aureus was more common. The staphylococcus aureus met with in the mouth is characterized by the production of a duller pigment than the staphylococcus aureus occurring in other suppurative lesions; it is somewhat rare for it to have the bright orange pigment generally associated with the name. The orange pigment may develop after a number of subcultures, especially when potato is used as the medium. Another type of staphylococcus not infrequently found, as the tables show, is the staphylococcus citreus granulatus described by Freund. This organism differs from the other staphylococci in being Gram-negative, and is often confounded with the micrococcus catarrhalis, which latter organism is present amongst the Gram-negative cocci isolated. A number of organisms of the micrococcus catarrhalis type have also been recognized as causal agents in the suppuration, but these organisms by no means all conform to the catarrhalis type, in that they frequently produced fermentation of one or other of the carbohydrates upon which they were tested; but the general type of a non-liquefying non-Gram-staining coccus, of somewhat large dimensions with a curious oat-like form, has been the type of organism under which the author has grouped the micrococcus catarrhalis.

The saccharomyces neoformans has been found four times in the present series, in two of the cases with severe local symptoms. It is not so frequently present as the other bacteria cited, but in most of the cases in which the author has met with it, in addition to those described here, these yeasts have been present in the hypertrophied gum tissues. The author also met with it in a new-growth of the sarcomatous type in the mouth, and this organism when inoculated into animals produces metastatic growths closely simulating sarcoma.

The last type of organism which the author found present amongst the fifty-one cases cited was the bacillus belonging to the somewhat ill-defined group of so-called diphtheroid bacilli. This organism closely resembles the diphtheria bacillus in its staining reaction in that it gives a positive reaction with Neisser; it does not produce toxemia when inoculated into guinea-pigs subcutaneously, but produces localized suppuration if any reaction occurs. There are two varieties, one which ferments cane sugar and lactose, and another which is uncertain in its fermentation; the colonies of the one on agar are minute gray, exceedingly sticky, and produce a brownish growth upon the surface of the agar, while the streaks of the other organism are yellowish in color, often almost orange, on the surface of potato; this organism shows the lesser amount of fermentation of the carbohydrates. The author has met with these diphtheroid bacilli in chronic periosteal swelling associated with local mouth-infection, more particularly in the region of the third molars.

A considerable number of other bacteria have been isolated and tested from these cases, but as they gave no agglutination with the patients' serum, no marked deviation from the normal as regards their opsonic index, and on inoculation into animals produced no local or general pathological lesions, their causal relation to the suppuration is probably little or *nil*, and they have therefore not been included in this account.

The method of treatment adopted in these cases has been the preparation of a specific vaccine from the given case, the organism or organisms chosen for the vaccine being those which showed a deviation from the normal in their opsonic index to the patient's own serum. The vaccines have been prepared in the ordinary way adopted in the author's laboratory, a small amount, 0.22 per cent. of tricresol being used as a preservative. As a rule, constitutional disturbance has been rare after the introduction of the vaccine, but in a few instances well-marked constitutional disturbances followed, such, for instance, as vomiting, acute headache, and general malaise, and in a few cases where the opsonic index was abnormally low to the organisms used as a vaccine (although the dose given had been properly reduced), the constitutional disturbances have been very definite and were considerably prolonged. It is not uncommon when the micrococcus catarrhalis is used as vaccine to get constitutional disturbance closely simulating an acute coryza, particularly in those persons who are susceptible to the common cold. When rheumatic symptoms are present an exacerbation may be looked for, but it does not, as a rule, occur unless the doses be too large.

As far as possible the treatment has been controlled by an examination of the opsonic index of the blood, but small variations have not been regarded as of great moment. Considerable variation in the index has been observed to take place immediately after the inoculation and following two or three of the earlier vaccinations, but after this, although the dose may be increased, the amount of response, as evinced by the determination of the opsonic index, is not great, and the clinical conditions, local and general, must be taken into account. After plotting out a considerable number of opsonic curves the author is of the opinion that the response to inoculation is definitely shown. The author considers, therefore, that although the error of observation of the opsonic index may be a large one, owing both to personal equation and mechanical errors, to say nothing of physiological variations in the leucocytes used, the opsonic index still gives a very considerable amount of information with regard to the progress of the cases, and should not be dispensed with.

It is perhaps scarcely necessary to lay down any special lines of local treatment in addition to the method of immunizing, as each case requires to be treated individually and from a general surgical standpoint. It is obviously impossible to expect that the denuded peridental membrane of the teeth, the destroyed alveolus, or the shrunken gum will return to the condition which existed prior to the disease by homologous immunization or any other means that can be devised. All that can be hoped for is to arrest the progress of the disease, to prevent the further destruction of the bony tissue, and where there still exists some framework of the bony tissue around the teeth, such tissue may undergo regeneration.

It follows, therefore, that where the so-called pockets exist around individual teeth, recourse must be had to active surgical methods. In the author's hands the use of the actual cautery has been attended with the best results, the cautery wounds healing quickly and rapidly after previous immunization has been undertaken. Much knowledge of the local condition may be obtained by the use of the X-ray photograph, and it is well in the early stages to determine how far absorption has taken place before recourse is had to surgical measures. Antiseptics are of little avail in the treatment of pyorrhea, and antiseptic mouth-washes never gain access to the sockets of the teeth unless they are forcibly applied by means of a fine-nozzled syringe; but scrupulous cleanliness is essential both after the removal of the loosened gum and during the process of treatment, the mechanical action of adhering food naturally tending to interfere with the healing of the tissues.

The chief disadvantage of this method of treatment is its necessarily prolonged nature, but as the majority of cases which come for treatment are of four to five years' standing at least, it is not surprising that the cases must be kept under observation for many months.

[*Les Annales Dentaires*, Paris, November, 1909.]

TREATMENT OF PARADENTAL CYSTS BY CAUTERIZATION WITH CREASOTE.

By Dr. Ed. Rivière.

In periosteal or paradental cysts the following treatment is recommended: The root is extracted, an opening is made into the deepest portion of the tumor with the thermo- or galvano-cautery, and the contents are emptied. Through this opening a cauterization with creasote is applied by painting carefully all the walls of the cysts. Vegetable creasote or pure oakwood creasote is used. For coating the walls of the cysts a cotton thread is wound around an excavator and dipped in creasote. The opening must be large enough to allow the passage of the cotton saturated with the caustic, yet sufficiently small to prevent the entrance of food during eating. Coating is to be preferred to injecting, as only a very slight quantity of the medicament can escape into the mouth. This treatment is so little painful that it can be administered without general or local anesthesia, which is so much dreaded by patients. The cysts generally heal in from five to six weeks, sometimes more rapidly. As the osteo-mucous walls of the cyst are not removed and do not collapse, the patient is not obliged to rinse out and remove food particles from the cavity after every meal. Neither is the closure of the cysts by a prosthetic obturator necessary, and the patient is able to eat without discomfort. No drainage is required, sav-

ing the patient all the discomforts of such. Healing has always been complete without recurrence, regardless of the size of the cyst treated.

[*Schweizerische Vierteljahrschrift fuer Zahnheilkunde*, Zurich, No. 3. 1909.]

ARTIFICIAL DENTURES AND THEIR DANGERS. By Dr. Kroenlein, Zurich.

A clinical history of twelve cases of swallowing of artificial dentures and one of aspiration is offered. In all these cases the dentures were more or less defective, and proved to be the work of cheap technical dentists. Still more astonishing than the poor workmanship of these dentures was the incredible indifference and carelessness exhibited by their wearers. Broken dentures were worn, although the patients were aware of their defects, others were poorly mended and altered by the wearers themselves. Frequently the dentures fell out of the patient's mouth in speaking, eating, yawning, etc. In some cases the denture was missed on awakening in the morning, the patient remembering that as usual he had not taken out his denture on retiring. Only one patient had been told by his dentist to remove the denture before retiring, and in the cases cited the patients were unaware of the dangers of leaving a denture *in situ* over night. The swallowing of the dentures occurred eight times during sleep, four times during eating, once during coughing and sneezing. Of the thirteen patients treated only one died, the others being skilfully saved, but only at the expense of a great deal of pain and fear. Four times the denture passed through the alimentary canal, four times extraction was possible through the mouth, five times laryngotomy, and once esophagotomy and extensive resection of the ribs and clavicle had to be resorted to, in order to combat the dangerous putrefaction and suppuration in the mediastinum of the thoracic space.

These experiences should impress every practitioner with the necessity of carefully instructing his patients as to the mode and hygiene of wearing artificial dentures.

PERISCOPE.

How to Bring Out Rubber Plates with a Smooth Surface on Both Sides.—Coat the model and counterpart with a solution of liquid silicate of soda, applied with a brush. This solution may be obtained at any drug store. If it be too thick, it may be thinned with alcohol.—X. Dodel, *Dental Summary.*

Prevention of Hemorrhage in Hemophiliacs.—By injections of fresh blood serum, after P. Emile Weil's method, hemorrhage can not only be stopped but prevented, which is especially advantageous in dental operations in hemophiliacs. The external and internal application of antipyrin also affords good results.—Chompret, *Annales Dentaires.*

Removal of Amalgam Fillings.—If for some reason an amalgam filling is to be removed, an old instrument which has been ground to a fine blunt end is strongly heated, and forced into the amalgam as deeply as possible. If necessary this operation is repeated. As soon as the patient declares that his tooth feels hot, quickly bur the amalgam, which comes off as easily as gutta-percha.—*Laboratoire et Progrès Dentaire.*

Prevention of Arsenical Poisoning in Pulp-Devitalization.—If the caries in a tooth extends below the gum, and the operator hesitates to insert an arsenic dressing for fear of arsenical poisoning of the gums, the cavity is cleaned as far as possible and filled with gutta-percha. A small hole is then burred in this filling down to the spot where the arsenic dressing is to be applied, and sealed with a little gutta-percha. In this way the operator is certain that the dressing does not come in contact with the gingival tissue.*—*Laboratoire et Progrès Dentaire.*

* A more perfect method, generally advocated in American dentistry, may be found on pages 475 and 476 of H. H. Burchard's "Text-book of Dental Pathology and Therapeutics," 3d edition, 1908.

How to Remove Hardened Modeling Compound from Impression Trays.—Put a tablespoonful of concentrated lye into a small pan of water. Place the impression trays in this solution for one hour; remove, and rinse in clean water. The softened compound will then be easily removed with a soft cloth. This leaves the trays looking like new. —R. L. HESSER, *Dental Summary.*

Prevention of Leakage in the Rubber Dam.—It sometimes happens that in spite of careful precautions the rubber dam slightly leaks. This can be avoided by cleaning the teeth which are to be put under the dam with a pledget of cotton saturated with 90 per cent. alcohol. The alcohol removes from the surfaces of the teeth all fatty substances, which facilitate the leakage of saliva and moisture through the smallest interstice.—*Laboratoire et Progrès Dentaire.*

Removing Glass Stoppers from Bottles.—The application of force, or heating over a flame, very often leads to breakage of a bottle from which the glass stopper cannot be removed. It is better to apply a few drops of fine sweet-oil around the stopper, and to allow the oil to remain for a short time, when the stopper can be turned. Or hold the bottle firmly beween the knees, wrap a thick twine twice around the neck of the bottle, and pull the ends of the twine to and fro. The neck of the bottle is thus heated and expands, while the stopper retains its own temperature and can easily be lifted off.—PAWELZ' *Zahntechnische Reform.*

Treatment of Empyema of Maxillary Antrum.—In the simple acute or subacute forms of suppuration of the maxillary sinus, where there are few granulations and no carious bone, lavage of the infected sinus with warm antiseptic solutions is often followed by cure. Irrigation of the maxillary sinus, however, cannot be effected through the normal opening, hence a trocar with cannula attachment must be introduced beneath the inferior turbinate bone a little above the floor and forced directly outward into the sinus. After penetrating the naso-antral wall about one inch from the external orifice of the nose, the trocar is removed, leaving the cannula *in situ.* Copious irrigations are then made directly through the tube. This procedure is especially useful and important in making a diagnosis, and sometimes in a few very early cases may establish a cure. A very practical method for surgical treatment of the sinus, and the one ordinarily employed by the writer, is to remove the anterior half of the inferior turbinate body with scissors or saw, puncture the wall near the floor of the nose, and finally make as large an opening through the naso-antral wall as desired. The opening, if sufficiently large, shows no tendency to close. The antrum is reached by this means and is thoroughly explored and cleaned. The first dressing usually consists in a simple sterile gauze packing with or without vaseline left for twenty-four to forty-eight hours. Later dressings are usually not employed. The cavity is left open for both drainage and ventilation. Any granulations which continue to form are removed from day to day.—H. G. LANGWORTHY, *Items of Interest.*

Identification of Criminals by the Teeth.—A whole band of burglars has been unmasked recently at Koenigs-Wusterhausen, Germany. A hard pear was found which one of the burglars had tried and thrown away. As the impression of the teeth showed an entirely abnormal position, all apprehended criminals were quietly watched, and it was soon possible by the position of his teeth to charge one criminal downright with participation in the crime. The burglar was so astounded that he not only confessed, but gave the names of his three companions. This incident again goes to emphasize the importance of the dento-legal expert.—LEWINSKI, *Deutsche Zahnaerztliche Wochenschrift.*

Dental vs. Medical Requirements.—A dentist to be successful must be a surgeon, an artist, a sculptor, and a mechanic. He must have the same mental grasp of the laws of physics, chemistry, and biology as is needed by the physician. He must have the manipulative skill that is required by the surgeon in his most delicate work. He must be able to take advantage of the finest requirements of the mechanic, and must have the ability to carry out those mechanical operations on living tissue in such manner as to cause no irritation thereto. His workshop is a hole in the face about two inches in diameter; in that hole he has to perform all of his operations, and the patient takes the work away with him.

In nine-tenths of the work done by the physician or surgeon, nature is expected to complete what he leaves. The dentist has to *do* his work. His failures stand out where he can always see them. The doctor buries his. Many deaths of infants are due to the physician's ignorance of the terrible effects of interrupted dentition. Most diseases are greatly aggravated by unsanitary oral conditions that the physician ignores completely,

but that every dentist appreciates. I venture the assertion that half the diseases that take toll of mankind will be controlled when dentistry has succeeded in teaching people to keep their mouths clean, and their teeth in condition to masticate their food properly and vigorously. The beauty, vigor, and health of the human body and mind are greatly dependent on the possession of a sound, useful masticating apparatus. Is not the man who is able to control this situation worthy of equal honor with the writer of prescriptions? Is he not a bigger man? Does he not deserve more credit? It takes him just as long to acquire his education. His dental course consists of three years of thirty-four weeks each, exclusive of holidays. He has to work from nine to five for six days every week. This course requires more hours' work than is covered by a three-year medical course. The dental student is grounded in the same fundamental subjects, such as anatomy, physiology, chemistry, histology, materia medica, pathology, bacteriology, etc., besides the many special subjects belonging solely to dentistry.

Dentistry gave anesthesia to the world (Wells and Morton both being dentists), and a Cleveland dentist is today teaching the medical profession how prolonged anesthesia can be secured with almost perfect safety without the use of dangerous chloroform or the sickening ether. The medical men, however, attempt to take the honor of anesthesia to themselves, just as they have claimed the honor of bacteriology, which was developed by Pasteur, an obscure chemist, whom the medical men were too supercilious to listen to for years.

There is another thing to which I want to direct your attention in connection with the dentist's shop. The man under his care is usually in a bad humor. He does not go to the dentist until he has to, as a rule, and as soon as he gets there he begins to fuss about countless other things he would rather be doing; as a result he gets peevish and will not sit still. The dentist has to show consideration. He must be tolerant; he has to do all the smiling, both for his patient and for himself; his best efforts are seldom appreciated. He is commonly regarded as a disagreeable necessity. His task is a thankless one; and because as a rule he is square and honest, and charges by the hour or by the operation, he does not make as much money as he ought to make. A surgeon can put up a bluff. He can make a mountain out of a mole-hill and charge the price for removing a tumor when he takes out a wart, and the patient will never be any the wiser. The most the physician has to do is to look wise and let nature take her course. Nature has precious little to do with the restoration of teeth in the human mouth.—Elbert Hubbard, *The Fra*.

Hints, Queries, and Comments.

A New Method for Taking Impressions.

In taking an impression, the operator usually tries to select a tray that will fit the mouth more or less perfectly—yet he may go farther, and construct for every individual case a perfectly fitting impression tray which is as simple as it is practical.

This impression tray may be obtained in the following manner: Take an impression of the case in modeling compound, being careful to copy all the details by pressing the compound well up against all parts. Remove the impression from the mouth, chill it, and the impression tray is ready.

This method does away with the piling up of plaster in an indefinite quantity on the old-style trays. The plaster impression is taken by simply covering the compound impression obtained with a little thin plaster and placing it back in the mouth, pressing it up or down, according to whether an upper or lower impression is being taken. After holding the impression in the mouth until the plaster sets, it can usually be removed with a snap, assuring the operator of a perfect impression.

The advantages of this method over the old one are many. The taking of impressions for either full or partial dentures, particularly the former, is made agreeable and pleasant for both the patient and the operator, while heretofore it was extremely disagreeable to the patient and far from pleasant to the operator. There is no gagging, as very little plaster is used. No reliefs are needed, as the soft parts are pressed down to a level with the hard parts, hence there can be no rocking. Last, but not least, one is enabled to make lower plates with suction nearly if not equally as good as in upper ones.

To have perfect success with this method, care must be taken to cut away liberally all undercuts that may be on the modeling compound impression.

J. F. Lief.

Brooklyn, N. Y.

KEEPING IMPRESSION TRAYS CLEAN.

In order to remove wax or plaster from impression trays, and to keep them clean and bright, apply steel wool No. 2 for removing the bulk, and No. 0 for polishing. They will then always look new.

C. V. Campbell.

Columbus, Neb.

OBITUARY.

DR. AMZI W. ALEXANDER.

Died, at Charlotte, N. C., January 12, 1910, of arterio-sclerosis, Amzi Wallace Alexander, D.D.S., at the age of seventy-nine years.

In the passing of Dr. Amzi W. Alexander the dental profession loses one of its most skilful and representative members, the South one of its most exemplary citizens, and the world a personality for whose having lived it was the better. His probity of character, kindly nature, genial and affable ways, with his always cheerful disposition, endeared him to all with whom he came in contact.

"He could not frame a word unfit,
An act unworthy to be done;
For Honor ever walked beside him,
To prompt his every glance and deed."

Dr. Alexander was the son of Robert McClung Alexander and Susan Rudisell, residents of Steel Creek Township, Mecklenburg county, N. C., where he was born November 16, 1830. His early education was obtained from such private schools and tutors as were available in the South at that time. Through a natural tendency toward mechanics he chose dentistry as a profession congenial to his tastes, and after a term under the preceptorship of Dr. E. H. Andrews he entered the Baltimore College of Dental Surgery, from which he was graduated in 1860. Returning to his native state, he located for practice in Charlotte. Soon after, however, the war between the states began, and Dr. Alexander enlisted in the Confederate army and served with credit until honorably discharged on account of disability; after which he returned and resumed the practice of his profession in Charlotte, where by virtue of his ability and skill he enjoyed a lucrative business until his retirement about ten years ago.

His death came after a lingering illness of several months, but the end was peaceful. He lived far beyond the allotted span and when the summons came it found him ready and waiting.

In 1856 Dr. Alexander was happily wedded to Miss Martha A. Wilson. Surviving this union are six children—Mrs. George B. Hanna, Miss Sallie Alexander, Dr. C. L. Alexander, and Mrs. Bessie Alexander Patterson, all of Charlotte; Mrs. John Springs of Hickory, and Mr. J. W. Alexander of Spartanburg, S. C. He is also survived by two sisters—Mrs. W. C. Bostick of Van Buren, Ark., and Mrs. C. J. Nugent of Newcastle, Ky.

R. I. P.

"IN MEMORIAM" RESOLUTIONS.

Dr. Dennis F. Keefe.

The following resolutions upon the death of Dr. Keefe were passed by the Rhode Island Board of Registration in Dentistry, February 11, 1910:

Resolved, That by the death of Dr. Keefe the community has suffered a loss of one whose genial personality, devotion to the welfare of the profession, and sixteen years' service as a member of the Board of Registration made him well and favorably known.

Resolved, That we, as members of the Rhode Island Board of Registration in Dentistry, extend our sincere sympathy to his family in their bereavement, and express to them our high regard of his personal and professional qualities.

Resolved, That a page of the records be devoted to these resolutions, that a copy be sent to his family, and that they be published in the dental journals.

Albert L. Midgley,
Harry L. Grant,
Committee.

Brief Necrology.

Dr. E. G. Glasgo of Brazil, Ind., February 12, 1910, in his thirty-fourth year.

Dr. Wm. B. Cassill of Walla Walla, Wash., January 30, 1910, in his forty-ninth year, of apoplexy.

Dr. George Wilber Walter of Peru, Ind., February 8, 1910, in his forty-second year, of pleurisy.

Dr. Jas. Washington Bartlett of Boston, Mass., February 3, 1910, in his seventy-fourth year, from a surgical operation.

Dr. Frank Willard Satterlee of La-Grange, Ill., March 10, 1910, in his fifty-ninth year, from complications following a bilious attack.

Dr. Emery M. Cheadle of Forest Grove, Oregon, February 22, 1910, in his fifty-ninth year. Deceased was a graduate in surgery and medicine, and practiced for several years before being graduated from the Chicago College of Dental Surgery in 1886. He was a member of the Oregon State Dental Board for two years.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS:

April, May, and June.

N. D. A. MEETINGS.

National Dental Association. Denver, Colo. July 19th to 22d.

N. D. A. Southern Branch. Houston, Texas. May 4th to 6th.

APRIL.

Connecticut State Dental Association. New Haven. Two days: April 19th and 20th.

Eastern Indiana Dental Association. Cambridge City. April 12th and 13th.

Odontological Society of Western Pennsylvania. Pittsburg. April 12th and 13th.

Southern Minnesota Dental Society. Mankato. Three days: April 11th to 13th.

Southwestern Michigan Dental Society. Coldwater. Two days: April 12th and 13th.

MAY.

Alabama Dental Association. Mobile. Four days: May 10th to 13th.

Canadian Dental Association and Ontario Dental Society. Toronto. Four days: May 31st to June 3d.

Illinois State Dental Society. Springfield. Four days: May 17th to 20th.

Indiana State Dental Association. Indianapolis. Three days: May 17th to 19th.

Iowa State Dental Society. Des Moines. Three days: May 3d to 5th.

Kansas State Dental Association. Topeka. Three days: May 17th to 19th.

Kentucky State Dental Association. Louisville. Three days: May 26th to 28th.

Lake Erie (Pa.) Dental Association. Cambridge Springs. Three days: May 17th to 19th.

Lebanon Valley Dental Association. Reading. Two days: May 10th and 11th.

Louisiana State Dental Society. New Orleans. Three days: May 9th to 11th.

Mississippi Dental Association. Jackson. Three days: May 24th to 26th.

Missouri State Dental Association. St. Louis. Four days: May 23d to 26th.

Montana State Dental Society. Great Falls. Two days: May 6th and 7th.

National Dental Association, Southern Branch, and Texas State Dental Association. Houston. Four days: May 3d to 6th.

Nebraska State Dental Society. Omaha. Three days: May 17th to 19th.

New Hampshire and Vermont Dental Societies. Rutland, Vt. Four days: May 17th to 20th.

New York State Dental Society. Albany. Three days: May 5th to 7th.

Ontario Dental Society and Canadian Dental Association. Toronto. Four days: May 31st to June 3d.

Susquehanna Dental Association of Pennsylvania. Harvey's Lake. Three days: May 24th to 26th.

Texas State Dental Association and National Dental Association, Southern Branch. Houston. Four days: May 3d to 6th.

Vermont and New Hampshire Dental Societies. Rutland, Vt. Four days: May 17th to 20th.

JUNE.

California State Dental Association. San Francisco. Four days: June 22d to 25th.

Georgia State Dental Society. Atlanta. Three days: June 14th to 16th.

Maine Dental Society. Rangeley. Three days: June 22d to 24th.

Maryland State Dental Association and District of Columbia Dental Society. Baltimore. Three days: June 9th to 11th.

Massachusetts Dental Society. Springfield. Three days: June 14th to 16th.

Michigan State Dental Society. Detroit. Three days: June 13th to 15th.

Northern Ohio Dental Association. Toledo. Three days: June 7th to 9th.

Pennsylvania State Dental Society. Harrisburg. Three days: June 28th to 30th.

Southern California Dental Association. Los Angeles. Three days: June 16th to 18th.

Examiners' Meetings.

Alabama Board of Examiners. Mobile. May 9th.

Arizona Board of Examiners. Tucson. April 18th to 21st.

Connecticut Dental Commissioners. Hartford. June 16th to 18th.

Illinois Board of Examiners. Chicago. June 13th.

Maryland Board of Examiners. Baltimore. May 19th and 20th.

Michigan Board of Examiners. Ann Arbor. June 20th to 25th.

Minnesota Board of Examiners. Minneapolis. March 15th to 17th.

Mississippi Board of Examiners. Jackson. May 17th.

Nebraska Board of Examiners. Lincoln. June 27th.

New Hampshire Board of Registration. Manchester. June 1st to 3d.

New Jersey Board of Registration. Trenton. July 5th to 7th.

North Carolina Board of Examiners. Wrightsville. July 11th.

Texas Board of Examiners. Houston. June 13th.

Washington Board of Examiners. Seattle. May 26th.

West Virginia Board of Examiners. Wheeling. June 8th to 10th.

DENTAL INDEX BUREAU

UNDER THE AUSPICES OF THE

NATIONAL ASSOCIATION OF DENTAL PEDAGOGICS.

The following matter has been issued in the form of a circular justly purporting to be "of especial interest to students, writers, publishers, editors, librarians, colleges, dental societies, etc." It is described as—

A Plan by which Subscribers will be Furnished a Classified Card Index of Articles in the Leading Dental Journals.

At a meeting of the National Institute of Dental Pedagogics, held in St. Louis last December, a committee was appointed to establish a Dental Index Bureau. Briefly stated, it is intended that this committee shall employ a competent person to review and classify all of the articles in ten or twelve of our leading dental journals, and shall furnish to each of

the subscribers to the Bureau, at frequent intervals, cards so classified and grouped that the subscriber may easily and quickly find all the articles on any subject in dentistry. These cards will be made on definite system, by which additional cards may be added as they are received and always go to their proper places; so that no matter how many additions may be made from year to year, all of the cards on each subject will be in a separate group. For example, all of the articles on the subject of filling teeth with gold will be in one group, all on filling teeth with amalgam in another, all on cavity preparation in another, all on alveolar abscess in another, etc.

It is hardly necessary to mention the value of such an index to the wide-awake members of the profession. Journals which may have accumulated, and which are now almost worthless on account of the difficulty in finding articles when desired, will become of service as the index is extended to cover them. The man who has occasion to look up a particular subject, or to write a paper, can find all that has been written on that subject instantly. The grouping of articles on each subject enables one to bring together the views of many writers. Post-graduate courses of study can be instituted by dental societies or undertaken by individuals; the ready reference index will make college libraries of the greatest value to the faculty and to the student body; editors and writers will find their work facilitated, and the results of their study more gratifying to themselves and more highly appreciated by their readers.

The idea of the committee is to organize a permanent society for the purpose of classifying and indexing all dental literature. The present plan is but preliminary to the greater work, which will cost less and less to individual subscribers as the number of members is increased. Those who help to start the work will profit more than those who follow, and will have the satisfaction of participating in one of the greatest advance movements in dentistry.

The subject-matter of several of the leading dental journals has already been classified and indexed by Dr. Arthur D. Black, at a great expenditure of time and money. This index contains about 40,000 cards, cataloging articles in various journals from 1839 to date; but it is not available, for obvious reasons, to the profession at large. Your committee is privileged to copy these cards, should the funds subscribed permit, which would be of great benefit to the subscribers and incidentally to the whole profession.

It is the committee's intention to this year furnish each subscriber with author and subject cards for all original articles, papers read before societies, book reviews, and editorials, in about ten journals for 1908 and 1909—from 4000 to 5000 cards, all properly arranged with all cards for each subject together, with guide cards for each subject and with author cards arranged alphabetically. It is expected that in 1910 the cards will be furnished for the same journals for the years 1907 and 1910; and in 1911 cards for 1906 and 1911. Thus in three years each subscriber will receive cards for these journals for six years—probably 25,000 to 30,000 cards. These cards will be sent in boxes in which they may be kept permanently. The number of journals indexed and the number of cards sent out by the committee, however, will depend upon the number of subscribers.

The preliminary report of this committee, which was made at the St. Louis meeting, gives an outline of the plan. It will be noticed that it is the intention to try this plan for a period of three years, and subscriptions at the rate of Twenty-five Dollars ($25.00) a year for that period may be sent to any member of the committee.

Subscriptions will be received from individuals, dental journals, dental schools, or dental societies. Any person or group of persons may send in a single subscription, and one set of cards will be sent in return. Subscription blanks may be had from any member of the committee.

Report of the Committee on Classifying and Indexing Dental Literature, to the Institute of Dental Pedagogics, at the annual meeting, St. Louis, 1908–1909.

The undersigned committee, appointed by the Institute of Dental Pedagogics for the purpose of devising ways and means for classifying and indexing current dental literature, as an evidence of progress presents to the members of the Institute and others interested the following plan:

1. That the subscribers to this plan organize themselves into an association to be known as The Dental Index Bureau.

2. That the above-mentioned committee, appointed by the Institute, will devise ways and means for carrying out the work of the Bureau during the coming year, and will call a meeting at the time and place of the next meeting of the Institute, for the perfecting of a permanent organization.

3. That this committee will employ a competent person to classify as much of the current dental literature as possible, beginning with January 1909 journals, and will furnish subscribers, at frequent intervals, with author and subject cards of all articles classified.

4. That this committee will be guided by a vote of the subscribers in the selection of the literature to be classified.

5. If the funds subscribed will permit, as much as possible of the literature of previous years will be similarly classified and indexed.

W. L. Fickes, *Chairman,*
Arthur D. Black,
Herman Prinz.

ROTTERDAM DENTAL SOCIETY.

Gnatho-dynamometer Prize Competition.

The Rotterdamsche Tandheelkundige Vereeniging (Rotterdam Dental Society) once more offers a prize of *f.*300 ($120, £25) for the invention of a gnatho-dynamometer suitable for use in dental practice.

The instrument is required to register a pressure up to 150 kilograms. Below 20 kgm. pressure the limit of error must not exceed 1 kgm., while under high pressure the limit of error should range within 2 kgm. The bite-plates must allow of introduction into an aperture of 1 cm.; if introduction be possible into an aperture of less than 1 cm. it will be regarded as a great advantage. The shape of the bite-plates is to be adaptable to the inclination of the masticatory surfaces. Under a pressure exceeding 20 kgm. the scale must be readily read off, or else calculable very readily. Although expected to register only the pressure in one direction, it should also allow of moderate lateral movement. In the front teeth only the normal incisal bite, not the overbite, should be measurable. The instrument must be simple, strong, and the parts which come in contact with the mouth must be readily sterilizable. The bite-plates should not damage the teeth, and must be so shaped that pressure can be brought to bear upon them at any point between the masticatory surfaces. After the pressure has been read off, the register must be easily readjustable.

Competitors are requested to submit a model of their instrument, postage prepaid, until October 1911, to the Rotterdamsche Tandheelkundige Vereeniging, 93 Aert van Nesstraat, Rotterdam, including a motto and directions for use, and a sealed envelope must be inclosed marked outside with the same motto, and containing the name and address of the inventor.

The jury is composed of the following dentists: B. Frank, A. A. H. Hamer, D.D.S., I. J. E. deVries, Amsterdam; C. H. Witthaus, D.D.S., Rotterdam; besides a technical expert. The decision of the jury will be made public in December 1911.

The result will be announced to all competitors, to whom their models will be returned. The prize will be conferred in January 1912, at the annual meeting of the Rotterdamsche Tandheelkundige Vereeniging.

M. Isebree Moens, *Sec'y.*

NATIONAL DENTAL ASSOCIATION MEETING

TO BE HELD AT

Denver, Col., July 19-22, 1910.

ORGANIZATION.

Officers.

Burton Lee Thorpe, St. Louis, Mo., *President.*

W. T. Chambers, Denver, Col., *Vice-president—West.*

C. W. Rodgers, Dorchester, Mass., *Vice-president—East.*

T. P. Hinman, Atlanta, Ga., *Vice-president—South.*

H. C. Brown, Columbus, Ohio, *Corresponding Secretary.*

Charles S. Butler, Buffalo, N. Y., *Recording Secretary.*

A. R. Melendy, Knoxville, Tenn., *Treasurer.*

Executive Committee.

J. D. Patterson, *Chairman,* Kansas City, Mo.

First Division—Committee on Arrangements.

J. D. Patterson, Kansas City, Mo.
C. M. Work, Ottumwa, Iowa.
W. G. Mason, Tampa, Fla.

Second Division—Committee on Credentials and Auditing.

V. H. Jackson, New York, N. Y.
H. B. McFadden, Philadelphia, Pa.
M. F. Finley, Washington, D. C.

Third Division—Committee on Voluntary Essays.

L. Meisburger, Buffalo, N. Y.
F. B. Kremer, Minneapolis, Minn.
C. J. Grieves, Baltimore, Md.

Executive Council.

H. J. Burkhart, *Chairman*, Batavia, N. Y.
A. H. Peck, Chicago, Ill.
B. Holly Smith, Baltimore, Md.
W. E. Boardman, Boston, Mass.
C. L. Alexander, Charlotte, N. C.
Burton Lee Thorpe, C. S. Butler (*ex-officio* members).

Organization of Sections.

Section I.

Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

Geo. H. Wilson, *Chairman*, Cleveland, Ohio.
Stanley L. Rich, *Vice-chairman*, Nashville, Tenn.
B. Frank Gray, *Secretary*, Los Angeles, Cal.

Section II.

Operative Dentistry, Nomenclature, Literature, Dental Education, and Allied Subjects.

L. L. Barber, *Chairman*, Toledo, Ohio.
Frank I. Shaw, *Vice-chairman*, Seattle, Wash.
F. L. Platt, *Secretary*, San Francisco, Cal.

Section III.

Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects.

Wm. Carr, *Chairman*, New York, N. Y.
L. F. Luckie, *Vice-chairman*, Birmingham, Ala.
Richard Summa, *Secretary*, St. Louis, Mo.

Clinics.

F. O. Hetrick, *Chairman*, Ottawa, Kans.
Howard S. Seip, *Vice-chairman*, Allentown, Pa.
L. A. Crumley, *Secretary*, Birmingham, Ala.
J. E. Chace, Ocala, Fla.
George E. Savage, Worcester, Mass.
J. J. Sarrazin, New Orleans, La.
H. H. Sullivan, Kansas City, Mo.
A. O. Ross, Columbus, Ohio.
J. D. Towner, Memphis, Tenn.
J. B. Howell, Paducah, Ky.
L. B. McLaurin, Natchez, Miss.
J. H. Lorenz, Atlanta, Ga.
F. L. Hunt, Asheville, N. C.
J. G. Fife, Dallas, Tex.
W. G. Dalrymple, Ogden, Utah.
R. D. Robinson, Los Angeles, Cal.
C. S. Irwin, Vancouver, Wash.
F. R. Henshaw, Indianapolis, Ind.
H. G. Nottage, Portland, Ore.
F. L. Wright, Wheeling, W. Va.
R. L. Simpson, Richmond, Va.
A. P. Burkhart, Buffalo, N. Y.
S. W. Bowles, Washington, D. C.
T. M. Hampton, Helena, Mont.
J. Bruce Perrin, Des Moines, Ia.

Local Committee of Arrangements.

E. R. Warner, *Chairman*, Denver, Col.
H. A. Fynn, *Vice-chairman*, Denver, Col.
W. P. Smedley, Denver, Col.
W. A. Brierley, Denver, Col.
W. W. Flora, Colorado Springs, Col.
W. T. Chambers (*ex-officio*), Denver, Col.

Chairmen of Sub-Committees.

Publicity—H. F. Hoffman, Denver, Col.
Clinics—A. W. Starbuck, Denver, Col.
Exhibits—John Steele, Denver, Col.
Entertainment—I. C. Brownlie, Denver, Col.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

Change of Date of Meeting.

The twenty-eighth annual session of the National Association of Dental Examiners will be held at the new Savoy Hotel, Denver, Col., commencing Monday, July 25, 1910, at 10 A.M. The rates will be $2.00 per day for one and $3.00 per day for two persons in room, European plan; large room for one or two with private bath $4.00 and $5.00 per day. Meeting and committee rooms at the service of the association, free, and every accommodation extended.

An early mail reservation is requested, the time being the busy season. A full representation from every state in the United States is earnestly desired.

J. J. Wright, *President*,
Wells bldg., Milwaukee Wis.
Chas. A. Meeker, *Sec'y*,
29 Fulton st., Newark, N. J.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The National Association of Dental Faculties will meet at the Hotel Shirley, Denver, Colo., Monday, July 25, at 10 o'clock A.M. The Executive Committee will meet to consider business of the association at 9 o'clock A.M., on the same day.

The Hotel Shirley is connected by bridge with the Savoy, where the meeting of the National Association of Dental Examiners takes place on the same date.

The rates will be $2.00 per day for one and $3.00 for two persons in one room, European plan. Large rooms for one or two persons with private bath, $4.00 and $5.00 per day.

B. Holly Smith, *Chm'n Ex. Com.* N. A. D. F.,
Baltimore, Md.

NATIONAL DENTAL ASSOCIATION—SOUTHERN BRANCH AND THE TEXAS STATE DENTAL ASSOCIATION.

Change of Date of Meeting.

The thirteenth annual meeting of the Southern Branch of the National Dental Association will be held in Houston, Texas, Wednesday, May 4, 1910, continuing in session three days. The association has accepted the invitation of the Texas State Dental Association to meet conjointly with them and as their guests.

The officers and members are actively at work, and a most instructive program is being arranged. A preliminary program will be announced later.

Carroll H. Frink, *Recording Sec'y*,
301 Masonic Temple, Jacksonville, Fla.

The annual meeting of the Texas State Dental Association will be held at Houston, Texas, May 3, 1910. On May 4, 5, and 6 the association will hold a joint meeting with the Southern Branch of the National Dental Association, at the same place. The profession is cordially invited to visit Texas on this occasion.

J. G. Fife, *Sec'y*,
Dallas, Texas.

PSI OMEGA FRATERNITY.

The annual banquet of the Psi Omega Alumni Fraternity will be held at the Hotel Manhattan on the evening of April 14, 1910.

Banquet Committee.

NEW YORK ALUMNI ASSOCIATION

Xi Psi Phi Fraternity.

The annual dinner of the New York Alumni Association, Xi Psi Phi Fraternity, will be held at Hotel Manhattan, Madison ave. and 42d st., New York city, at 8 P.M. on Saturday, April 2, 1910. Arrangements have been made for every alumnus residing in or about New York city, and it is hoped that all will take advantage of this opportunity to meet their old classmates again.

J. N. Gelson, *Sec'y*,
Brooklyn, N. Y.

EASTERN INDIANA DENTAL ASSOCIATION.

The Eastern Indiana Dental Association will hold its thirty-ninth annual meeting at Cambridge City, Ind., on April 12 and 13, 1910.

A. O. Martin, *Sec'y*.

ODONTOGRAPHIC SOCIETY OF WEST PHILADELPHIA.

On April 4, 1910, the Odontographic Society of West Philadelphia will give a smoker and buffet supper in place of its usual meeting. The affair will be held in the amphitheater of Dental Hall, University of Pennsylvania, and the Entertainment Committee are making strenuous efforts for a good time.

R. R. Parks, *Sec'y*.

ODONTOLOGICAL SOCIETY OF WESTERN PENNSYLVANIA.

The Odontological Society of Western Pennsylvania will hold its twenty-ninth annual meeting at the Monongahela House, Pittsburg, Pa., April 12 and 13, 1910.

The program includes papers by Dr. J. Leon Williams of London, England, Dr. J. P. Buckley of Chicago, and others. A large

list of clinics is being prepared and the "biggest ever" meeting is expected.

A large hall is reserved for exhibitors and many new and interesting exhibits will be shown. Spaces may be reserved by application to Dr. W. W. Booth of Carnegie, Pa.

All ethical dentists are invited to attend this meeting and join the society. For information address

Program Committee—Dr. C. E. Peters, Fulton bldg., Pittsburg; Dr. J. H. Crawford, Diamond Bank bldg., Pittsburg, Pa.

Exhibit Committee—Dr. W. W. Booth, Carnegie.

Membership Committee—Dr. Jno. F. Biddle, Arch st., N. S., Pittsburg.

SOUTHERN MINNESOTA DENTAL SOCIETY.

THE twenty-fifth annual meeting of the Southern Minnesota Dental Society will be held in the Saulpaugh Hotel, Mankato, Minn., April 11, 12, and 13, 1910.

C. A. HINTZ, *Sec'y.*

SOUTHWESTERN MICHIGAN DENTAL SOCIETY.

THE annual meeting of the Southwestern Michigan Dental Society will be held at Coldwater, Mich., April 12 and 13, 1910.

C. W. JOHNSON, *Sec'y,*
Lawton, Mich.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE next annual meeting of the Connecticut State Dental Association will be held in Warner Hall, New Haven, Conn., April 19 and 20, 1910.

R. H. W. STRANG, *Sec'y,*
Bridgeport, Conn.

ALABAMA DENTAL ASSOCIATION.

THE next annual meeting of the Alabama Dental Association will be held in Mobile, Ala., May 10, 11, 12, and 13, 1910. All ethical dentists are cordially invited.

E. W. PATTON, *Sec'y,*
Selma, Ala.

INDIANA STATE DENTAL ASSOCIATION.

THE fifty-second annual meeting of the Indiana State Dental Association will be held in Indianapolis, May 17 to 19, 1910, at the Claypool Hotel. This promises to be a great meeting.

OTTO U. KING, *Sec'y,*
Huntington, Ind.

ILLINOIS STATE DENTAL SOCIETY.

THE forty-sixth annual meeting of the Illinois State Dental Society will be held in Springfield, May 17, 18, 19, and 20, 1910.

In addition to an especially good list of essays and clinics, an unusually attractive supply exhibit is being planned.

J. F. F. WALTZ, *Sec'y,*
Decatur, Illinois.

SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA.

THE forty-seventh annual meeting of the Susquehanna Dental Association of Pennsylvania will be held at Hotel Oneonta, Harvey's Lake, Luzerne co., Pa., Tuesday, Wednesday, and Thursday, May 24, 25, and 26, 1910. Harvey's Lake is a beautiful mountain resort twelve miles from Wilkes-Barre, and the Oneonta is a modern summer hotel.

An excellent program of papers and clinics is being prepared, and among those who will participate are Drs. V. H. Jackson, New York, E. C. Kirk, Louis Jack, E. T. Darby, H. C. Register, J. G. Lane, Philadelphia, and C. S. Van Horn, Bloomsburg.

Exhibitors desiring space should address Dr. F. L. Davenport, N. Franklin st., Wilkes-Barre. All other communications should be sent to Dr. A. E. Bull, S. Washington st., Wilkes-Barre.

All ethical practitioners are cordially invited to consider this notice an invitation to be our guest for these three days. Mark off the days now, and come.

A. E. BULL,
E. J. DONNEGAN,
W. E. DAVIS,
Publicity Committee.

VERMONT AND NEW HAMPSHIRE DENTAL SOCIETIES.

JOINT MEETING.

THE Vermont and New Hampshire Dental Societies will hold a joint meeting at Rutland, Vt., May 17 to 20, 1910.

HARRY F. HAMILTON, *Sec'y*,
Newport, Vt.

KANSAS STATE DENTAL ASSOCIATION.

THE next annual meeting of the Kansas State Dental Association will be held in Topeka, Kans., May 17, 18, and 19, 1910.

EDWARD BUMGARDNER, *President*.
H. W. FESSENDEN, *Sec'y*.

KENTUCKY STATE DENTAL ASSOCIATION.

THE forty-first annual meeting of the Kentucky State Dental Association will be held in Louisville, May 26, 27, and 28, 1910.

An unusually interesting and profitable program is being arranged for this year, and a cordial invitation is extended to all ethical members of the profession.

W. M. RANDALL, *Sec'y*,
Cor. Brook and Broadway, Louisville, Ky.

LOUISIANA STATE DENTAL SOCIETY.

CHANGE OF DATE OF MEETING.

THE thirty-second annual meeting of the Louisiana State Dental Society will be held at the Grunewald Hotel, in New Orleans, La., May 9, 10, and 11, 1910.

A cordial invitation is extended to all who attend the Southern Branch of the N. D. A., which will convene in Houston, Texas, May 4th to 6th. Special railroad rates all the way to New Orleans; also special rates at the Hotel Grunewald, our headquarters and meeting-place.

Stop over to visit historic New Orleans, as well as enjoy the famous Creole cooking.

J. A. GORMAN, *Ch'm Ex. Com.*,
1108 Maison Blanche Bld'g, New Orleans, La.

CANADIAN AND ONTARIO DENTAL ASSOCIATIONS.

THE Canadian Dental Association and Ontario Dental Society will hold a joint convention in Toronto, Canada, May 31 to June 3, 1910.

MISSISSIPPI DENTAL ASSOCIATION.

THE seventeenth annual meeting of the Mississippi Dental Association will be held in Jackson, in the Senate chamber of the Capitol, May 24 to 26, 1910. All ethical dentists are invited.

L. B. PRICE, *Sec'y*,
Corinth, Miss.

LAKE ERIE (PA.) DENTAL ASSOCIATION.

THE forty-seventh annual meeting of the Lake Erie Dental Association will be held at Hotel Rider, Cambridge Springs, Pa., May 17, 18, and 19, 1910. All reputable practitioners are cordially invited to attend.

V. H. MCALPIN, *Sec'y*.

IOWA STATE DENTAL SOCIETY.

THE forty-eighth annual meeting of the Iowa State Dental Society will be held at Des Moines, May 3, 4, and 5, 1910. Besides an especially strong program, plans are being made for a large dental manufacturers' exhibit. Display space free of charge.

W. G. CRANDALL, *Sec'y*,
Spencer, Iowa.

MISSOURI STATE DENTAL ASSOCIATION.

THE forty-fifth annual meeting of the Missouri State Dental Association will convene in St. Louis, May 23, 24, 25, and 26, 1910. This meeting will be the greatest in the history of the association. The Committee on Reorganization will have their duty performed by that time, and the attendance will be double that of former years.

The papers will not be many, but of the very best. Drs. G. V. Black and J. V. Conzett will be the guests of the society, which assumes that something worth while will be going on.

The clinics will be very extensive, but bring yours along; it will help someone.

Mark off the dates.

J. F. WALLACE, *Sec'y*,
Canton, Mo.

MAINE DENTAL SOCIETY.

THE next meeting of the Maine Dental Society will be held June 22 to 24, 1910, at the Rangeley Lake House, Rangeley, Me.

I. E. PENDLETON, *Sec'y*.

MASSACHUSETTS DENTAL SOCIETY.

CHANGE OF DATE OF MEETING.

THE Massachusetts Dental Society will hold its forty-sixth annual meeting at Springfield, June 14, 15, and 16, 1910. An attractive program will be presented.

Ethical practitioners of dentistry residing in the state of Massachusetts who may desire to join the society are requested to send their names and addresses to

CHARLES W. RODGERS, *Sec'y*,
165 Harvard st., Dorchester, Mass.

UNIVERSITY OF ILLINOIS COLLEGE OF DENTISTRY.

ALUMNI ASSOCIATION.

THE Alumni Association of the College of Dentistry, University of Illinois, will hold their third annual clinic and meeting on Wednesday, June 1, 1910, in the college building, corner Harrison and Honore sts. This will be a strictly alumni clinic, but ethical members of the profession are invited to be present.

FRANK J. RYAN, *Sec'y*.

CALIFORNIA STATE DENTAL ASSOCIATION.

CHANGE OF DATE OF MEETING.

THE thirty-seventh annual meeting of the California State Dental Association will be held in San Francisco, June 22 to 25, 1910. An interesting program of papers and clinics is being arranged, and it will be one of the most instructive meetings ever held on the coast. Eastern friends are invited to attend on their way to Denver.

C. E. POST, *Sec'y*,
San Francisco, Cal.

NORTHERN OHIO DENTAL ASSOCIATION.

THE fifty-third annual meeting of the Northern Ohio Dental Association will be held in Toledo, at Hotel Secor, June 7, 8, and 9, 1910.

It is a good time now to plan for this meeting. Excellent papers, fine exhibits, A 1 clinics, and a rare meeting-place.

G. F. WOODBURY, *Ch'man Ex. Committee*,
Cleveland, Ohio.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

THE thirteenth annual meeting of the Southern California Dental Association will convene June 16, 17, and 18, 1910, at the College of Dentistry, University of Southern California, Fifth and Wall sts., Los Angeles. Visiting dentists are cordially invited.

This is the first of the coast meetings, and is followed by the California State Dental Association, at San Francisco, the Oregon Association at Portland, and the Washington Association at Seattle.

These meetings convene at intervals of a few days, the series being completed in time to reach Denver for the National Dental Association.

B. FRANK GRAY,
Ch'man Publ. Com.

MARYLAND STATE DENTAL ASSOCIATION AND DISTRICT OF COLUMBIA DENTAL SOCIETY.

A JOINT meeting of the District of Columbia Dental Society and the Maryland State Dental Association will be held in Baltimore, at the Dental Department of the Baltimore Medical College, June 9, 10, and 11, 1910.

A cordial invitation is extended to all ethical members of the profession to attend and participate. Exhibitors requiring space are requested to communicate with Dr. Geo. R. Carter, 712 N. Eutaw st., Baltimore, Md.

For further particulars address

H. M. SCHOOLEY,
1110 F st., Washington, D. C.
F. F. DREW,
701 N. Howard st., Baltimore, Md.

PENNSYLVANIA STATE DENTAL SOCIETY.

The Pennsylvania State Dental Society will hold its next annual meeting in the Board of Trade Building, 112-116 Market st., Harrisburg, June 28, 29, and 30, 1910.

Luther M. Weaver, *Recording Sec'y*,
Philadelphia, Pa.

GEORGIA STATE DENTAL SOCIETY.

The forty-fourth annual meeting of the Georgia State Dental Society will be held in Atlanta, Ga., June 14, 15, and 16, 1910.

DeLos L. Hill, *Sec'y*,
Atlanta, Ga.

MICHIGAN STATE DENTAL SOCIETY.

The next annual meeting of the Michigan State Dental Society will be held in Detroit, Mich., June 13, 14, and 15, 1910.

Don M. Graham, *Sec'y*,
Detroit, Mich.

NEW JERSEY STATE DENTAL SOCIETY.

The fortieth annual meeting of the New Jersey State Dental Society will convene in Asbury Park, N. J., at the Casino, July 20, 21, 22, and 23, 1910. This is to be the largest meeting ever held; two days will be devoted to different and interesting clinics, which should not be missed. Many fine and instructive papers to be read. The Hotel Columbia will be the headquarters of the society.

Asbury Park is ideal for the meetings of the society, with its ocean frontage, large and cool. The entire floor of the Casino is to be leveled for the exhibits, which will be many and varied, and everything new will be shown.

Asbury Park can be readily reached by rail, boat, or motor, and will be a good resort for the visitors to bring their families, who will find the hotels large and commodious and the entertainment of a high class, while they attend the meetings. No one can afford to miss this meeting. Prospective members, ethical practitioners of other states, and members of local societies are cordially invited.

For further information address

Charles A. Meeker, *Sec'y*,
29 Fulton st., Newark, N. J.

NORTH CAROLINA DENTAL SOCIETY.

The thirty-sixth annual meeting of the North Carolina State Dental Society will be held July 13 to 16, 1910, at Wrightsville, N. C. The Seashore Hotel will be the headquarters.

Arthur H. Fleming, *Sec'y*,
Louisburg, N. C.

WISCONSIN STATE DENTAL SOCIETY.

The fortieth annual meeting of the Wisconsin State Dental Society will be held at Ashland, Wis., July 12, 13, 14, and 15, 1910.

Harvey N. Jackson, *President*,
Milwaukee, Wis.
M. L. Christensen, *Sec'y*,
Oshkosh, Wis.

VIRGINIA STATE DENTAL ASSOCIATION.

The forty-first annual session of the Virginia State Dental Association will be held at Staunton, Va., July 20 to 22, 1910.

Every effort is being made to make this the most interesting and successful meeting of our society. Men of national reputation will give clinics and read papers. All ethical practitioners are cordially invited to attend.

W. H. Pearson, *Corr. Sec'y*,
Hampton, Va.

FIRST AND SECOND DISTRICTS DENTAL SOCIETY OF LOUISIANA.

At the last meeting of the First and Second Districts Dental Society of Louisana, the following officers were elected to serve through the ensuing year: E. J. Zeidler, president; S. S. Grosjean, vice-president; W. C. Richardson, treasurer; G. N. Weiss, secretary. Dr. L. D. Archinard was elected to replace Dr. S. S. Grosjean as a member of the Executive Committee.

Suitable resolutions were drawn up and inserted on a separate page of the minutes, on the death of Dr. J. J. Archinard, A.M., M.D., an honorary member of this society.

G. N. Weiss, *Sec'y*,
New Orleans, La.

CHICAGO ODONTOGRAPHIC SOCIETY.

At the February meeting of the Chicago Odontographic Society, the following officers were elected for the ensuing year: Frank H. Zinn, president; G. C. Poundstone, vice-president; T. L. Grisamore, secretary; G. W. Dittmar, treasurer, and H. F. Methven, librarian. Member of Board of Directors—A. D. Black. Board of Censors—G. N. West, E. W. Elliott, and L. W. Strong.

T. L. Grisamore, *Sec'y.*

ARIZONA BOARD OF EXAMINERS.

There will be a meeting of the Arizona Board of Dental Examiners, April 18 to 21, 1910, at Tucson, Ariz.

Candidates should have in their application, and fee of $25.00 should accompany same, at least twenty days before meeting. Theoretical examination includes the following subjects: Anatomy, physiology, chemistry, materia medica, therapeutics, metallurgy, histology, pathology, operative and mechanical dentistry, oral surgery; practical demonstration of skill in operative and mechanical dentistry will also be required, and candidates should come prepared with instruments and material for making fillings and crowns in the mouth.

W. A. Baker, *Sec'y.*

MARYLAND BOARD OF EXAMINERS.

The Maryland State Board of Dental Examiners will meet for examination of candidates for certificates May 19 and 20, 1910, at the Dental Department of the Baltimore Medical College, Baltimore, at 9 A.M.

Candidates must pass a written examination in anatomy and physiology, oral surgery, chemistry and bacteriology, pathology, therapeutics and materia medica, operative and prosthetic dentistry. The practical tests are the insertion of a gold filling in the mouth, and the submission of a metal plate or bridge of not less than four crowns, two being of porcelain, the parts being assembled and invested in advance and soldered in the presence of the board.

Applications, accompanied by the fee of ten dollars, must be filed with the secretary prior to May 19th.

For further information address

F. F. Drew, *Sec'y,*
701 N. Howard st., Baltimore, Md.

WASHINGTON BOARD OF EXAMINERS.

The Washington State Board of Examiners will meet in Seattle, Wash., May 26, 1910, for examination of applicants for license to practice dentistry.

Wm. B. Power, *Sec'y,*
Seattle, Wash.

NEW HAMPSHIRE BOARD OF REGISTRATION.

The next meeting of the New Hampshire Board of Registration in Dentistry for examinations will be held at Masonic Banquet Hall, Manchester, N. H., June 1, 2, and 3, 1910.

No special examinations. All persons must become registered before beginning practice.

A. J. Sawyer, *Sec'y,*
Manchester, N. H.

ALABAMA BOARD OF EXAMINERS.

The Board of Dental Examiners for the state of Alabama will meet in Mobile, Ala., on the Monday before the second Tuesday in May 1910. In addition to the regular written examination, the following requirements will be added: Each applicant must fill at least two teeth, approximal cavities, one with gold, the other with alloy, work to be done under the immediate supervision of the board, the latter to determine or pass on suitable selections of cavities. The board will try to furnish subjects, but failing to do so, applicants for license must find or bring their own subjects, also instruments and material.

Each applicant must take or have taken an impression of their own mouth, make a plaster cast of the same, cut from the cast the six anterior teeth, and make a bridge for the same with porcelain facings. Cast can be made and facings fitted before the examination, but the backings must be put on and facings arranged, also invested and soldered, under the supervision of the board, hard solder being required; or the applicant must pass any other test the board may desire.

Thos. P. Whitby, *Sec'y.*

NEBRASKA DENTAL BOARD.

The regular meeting of the Nebraska Dental Board for the examination of applicants for license to practice dentistry in Nebraska will be held in Lincoln, at the State-house, beginning Monday, June 27, 1910, at 9 A.M. All applications must be in the hands of the secretary by June 20th. For application blanks and other information address

H. C. Brock, *Sec'y*,
North Platte, Nebr.

TEXAS BOARD OF EXAMINERS.

The regular meeting of the Texas State Board of Dental Examiners will be held in Houston, Texas, beginning 9 A.M. Monday, June 13, 1910. Diplomas not recognized or registered; examination required of all. No interchange of license with any other state. No special examination to practitioners already in active practice. Applications, accompanied by a fee of twenty-five dollars, should be in the secretary's hands by June 10th.

For further information address,

Bush Jones, *Sec'y*,
Dallas, Texas.

ILLINOIS BOARD OF EXAMINERS.

The semi-annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for license to practice dentistry in the state of Illinois will be held at the Northwestern University Dental School, corner Lake and Dearborn sts., beginning Monday, June 13, 1910, at 9 A.M.

The following preliminary qualifications shall be required of candidates to entitle them to examination by this board for license to practice dentistry in the state of Illinois: Graduates of a reputable dental or medical school or college, or dental department of a reputable university, who enter the school or college as freshmen on or after the school year 1906-07, must have a minimum preliminary education of not less than graduation from an accredited high school or a certificate from the state superintendent of public instruction, equivalent officer or deputy, acting within his proper or legal jurisdiction, showing that the applicant had an education equal to that obtained in an accredited high school; which certificate shall be accepted in lieu of a high-school diploma.

Candidates will be furnished with proper blanks and such other information as is necessary on application to the secretary. All applications must be filed with the secretary five days prior to date of examination. The examination fee is twenty dollars, with an additional fee of five dollars for a license.

Address all communications to

T. A. Broadbent, *Sec'y*,
705 Venetian Bldg., Chicago, Ill.

WEST VIRGINIA BOARD OF EXAMINERS.

The West Virginia State Board of Examiners will hold a meeting at Wheeling, W. Va., June 8, 9, and 10, 1910. Applicants for examination must file their applications, together with the fee of twenty-five dollars.

For blanks and other information address

J. Fleetwood Butts, *Sec'y*,
Charleston, W. Va.

MICHIGAN BOARD OF EXAMINERS.

The next regular meeting of the Michigan State Board of Dental Examiners for the examination of applicants for registration will be held at Ann Arbor, Mich., beginning Monday, June 20th, and continuing until the 25th. Applications must be in the hands of the secretary at least fourteen days before the examination, and should be addressed to

A. W. Haidle, *Sec'y*,
Negaunee, Mich.

NEW JERSEY BOARD OF REGISTRATION.

The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the Assembly chamber of the State-house at Trenton, N. J., July 5, 6, and 7, 1910. Practical work on the 5th, and the theoretical examination the 6th and 7th. All applications must be in the hands of the secretary ten days prior to the meeting. Applicants must send pre-

liminary credentials and photograph with the application, or it will not be accepted.

Sessions begin promptly at 8 A.M. each day.

CHAS. A. MEEKER, D.D.S., *Sec'y*,
29 Fulton st., Newark, N. J.

NORTH CAROLINA BOARD OF EXAMINERS.

THE next annual meeting of the North Carolina State Board of Dental Examiners will be held at Wrightsville, N. C., commencing on July 11, 1910. All applications for examinations must be accompanied with a diploma from a reputable dental school, which must be filed with the secretary by 9 A.M. on the first day of the meeting.

For requirements and further information address

F. L. HUNT, *Sec'y*,
Asheville, N. C.

ARMY DENTAL CORPS.

MEMORANDUM of changes of stations and duties of contract dental surgeons, U. S. Army, for the week ending February 26, 1910:

Robert T. Oliver, examining and supervising dental surgeon, February 24th: Par. 1, S. O. 288, December 11, 1909, W. D., is so amended as to assign him to duty and station at Fort Hamilton, N. Y., instead of Fort Hancock, N. J.

F. L. K. LaFlamme, February 24th, left Fort Sheridan, Ill., *en route* to Philippine Islands for duty.

Raymond E. Ingalls, February 19th, upon arrival at San Francisco, Cal., will proceed to Fort Douglas, Utah, for duty.

For the week ending March 5th:

Geo. E. Stallman, February 28th, left Fort Logan H. Roots, Ark., *en route* to station at Fort Sam Houston, Texas.

R. H. Mills, February 27th, reported for temporary duty at Fort Niagara, N. Y.

Geo. D. Graham, March 1, reports for temporary duty at Fort Crook, Neb.

For the week ending March 12th:

George I. Gunckel, March 8th, reports for temporary duty at Fort Moultrie, S. C., left Fort Morgan, Ala., on March 4th.

John R. Ames, March 7th, returned to Fort Snelling, Minn., from duty at Fort Yellowstone, Wyo.

Robert H. Mills, March 9th, reported for temporary duty at Fort Ontario, N. Y.

For the week ending March 19th:

Raymond E. Ingalls, March 16th, granted ten days' leave of absence.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING FEBRUARY 1910.

February 8.

No. 948,484, to GEORGE B. SNOW. Dental plugger.

No. 948,711, to E. R. STEALY. Casting machine.

February 15.

No. 949,134, to NATHAN SULZBERGER. Local anesthetic.

No. 949,273, to CHRISTIAN HINRICHSEN. Guard for dental handpieces.

No. 949,391, to CARL S. CARBERG and THEODOR E. RYAN. Apparatus for making dental castings.

No. 949,480, to E. S. HODGSON, Jr. Dental nozzle.

No. 949,540, to F. E. KRESS. Folding toothbrush.

February 22.

No. 950,106, to ALEXANDER JAMESON. Casting apparatus.

No. 950,109, to M. W. LEVKOWICZ. Saliva ejector.

No. 950,294, to E. O. LOTHAMER. Swaging machine.

THE

DENTAL COSMOS.

VOL. LII. MAY 1910. No. 5.

ORIGINAL COMMUNICATIONS.

THE EFFECTS OF BRACHYCEPHALY AND DOLICHOCEPHALY ON THE TEETH OF MAN.

By RAYMOND C. OSBURN, Ph.D., New York, N. Y.,
INSTRUCTOR IN ZOOLOGY, COLUMBIA UNIVERSITY.

IT is my purpose to present for your consideration some facts about the human dentition, and to offer in explanation of them a principle of comparative anatomy which I believe suffices to explain them. Dentists, and particularly orthodontists, have been greatly puzzled by the variations in the form of the dental arch and teeth, and by various conditions of prognathism (protruding jaws) and orthognathism (short jaws) encountered in the human dentition. Some writers in orthodontia have gone so far as to practically postulate an ideal form of dental arch into which they would mold every tooth series, even if it should be necessary to extract some of the teeth to accomplish this. My purpose is to show you that such variation may be entirely normal—barring, of course, malocclusal conditions; that it is correlated with other conditions of the body, and moreover that phenomena of the same kind are exhibited by lower animals.

Anthropologists have examined this question only in a very general way, and without basing their study on comparative anatomy; comparative anatomists have thus far overlooked these conditions in man, and dentists and orthodontists have not seen far enough beyond the teeth themselves to discover much correlation with other structures.*

* I was not aware at the time this paper was presented that Dr. E. H. Angle had touched upon this matter in an address before the American Society of Orthodontists in 1905. In that paper he struck at the very root of the matter, and clearly expressed the truth that such a correlation exists in man. The following extract will serve to illustrate how fully he had grasped the principle: "The short stocky individual with round head will be found to have a dental arch in perfect harmony with the individual—namely, a well-rounded arch and short broad patterns of incisors, which in size correspond with the rest of his frame. If the individual is tall, slender, and angular, with long, narrow face, the dental arch will be correspondingly narrow and long, with greater angle of inclination of incisors, which will be of a longer and narrower pattern and also varying in size to be in harmony with the rest of the individual. . . . And this is not limited to the Caucasian race, but applies to the offspring of man of all races and in all ages."

It has long been known that great variations exist in the human cranium, and Huxley in 1867 recorded examples which approach the limit of this variation. We owe the terms brachycephaly (shortheadedness) and dolichocephaly (longheadedness) to the anthropologists —beginning with the elder Retzius—who made use of these differences in form in the attempt to trace the relationships of the various human races. It must be recalled, however, that the anthropologists apply these terms to the braincase alone (craniometry), measuring from the glabella to the most posterior part of the cranium. The comparative anatomist, on the other hand, applies them to the skull as a whole, and measures to the end of the jaws. This will lead us to confusion unless we keep that difference clearly in mind, for I shall use the terms as they are used in comparative anatomy.

	Brachycephaly.	**Dolichocephaly.**
Dental series	Crowded.	Elongate.
Diastemata	Closed.	Increased.
Anterior premolars	Suppressed.	Persistent and spaced.
First premolar	One root suppressed.	Two roots retained.
Intermediate tubercle of molars	Persistent.	Reduced.
Opposite dental series	Convergent or arched.	More parallel.
Grinding teeth	Shortened and widened.	Lengthened and narrowed.
Cingula between teeth	Suppressed.	Persistent.
Canine teeth	Rounded and broadened.	Elongate compressed.
Incisor series	Placed transversely.	Converging anteriorly.
Palate	Broadened and flattened.	Narrowed and transversely arched.
Zygomata	Broadened.	Elongate.
Jaw	Shortened.	"

Differences in skull length in lower animals were recognized as early as 1864 by Nathusius, who pointed them out in domesticated races of swine. Kowalewsky (1873) called attention to the elongated face in ungulates in connection with the elongated teeth, and Wortman and Matthew (1899) demonstrated the existence of long- and short-jawed dogs of the Tertiary. Osborn (1900) was the first to make a definite study of the conditions exhibited by these two types of skulls in all their structures in the rhinoceroses; later (1902) he applied the same method of study to a number of groups of lower animals. According to his observations there is a surprising amount of correlation between structures, embracing all the bones of the head, the teeth, and even the limbs. Osborn's table of correlated skull characters, based on a study of the titanotheria, is so widely applicable that I cannot refrain from abstracting that portion of it which deals especially with the jaws and teeth:

—and so on for thirty-seven characters of the skull. In this paper Osborn indicates the application of this principle to a number of groups of the ungulates, to the carnivores, and to the lower primates, and shows their significance in adaptation. Attention is also called to the fact that occasionally one region of the skull may vary in length without affecting all the other parts, but such modification is always adaptive.

In addition to the work already cited, it may be mentioned that Matthew (1901) has made use of the principle in the classification of the oreodonts, Gregory (1903) has studied the progressive brachycephaly of the elephant, and Hrdlička (1906) has shown in the orangs of western Borneo that some are moderately brachycephalic, while others are mesocephalic or intermediate in length.

My own observations have led me to

believe that perhaps all of the mammalian groups may be so affected. The rodents certainly vary in this respect, as do the bats. Indeed, the most striking case of brachycephaly that has come to my notice is that of a bat (*Centurio senex*) in which the dental arch is fully twice as wide as it is long and the teeth modified accordingly. In the fruit-bat (*Pteralopex* sp.), on the other hand, the proportions are reversed, so that the arch is nearly twice as long as wide, the opposite series nearly parallel, and the teeth well spaced.

tions—*Cynocephalus,* the "dog-faced baboon," and *Colobus,* the Guereza monkey, respectively.* These both belong to the catarrhine or "old-world" monkeys, and have the same complement and arrangement of teeth as man. On comparing the skulls and teeth of these animals we find a majority of the points indicated in Osborn's table beautifully illustrated. The side views (Fig. 1) give us the general proportions of the skulls and the relations of the teeth to the jaws. The angle of the lower jaw and the abbreviation of the region in front of

FIG. 1.



Colobus. *Cynocephalus.*

The tendency to the development of long- and short-headed forms is not even confined to the mammals, but may be observed in fishes, amphibians, and reptiles. However, as these groups of animals have only simple teeth of a widely varying number and arrangement, they have no special importance in the problem before us, except inasmuch as they illustrate the general tendency of vertebrates to vary in skull length.

Let us now examine the conditions exhibited by two skulls of primates,* since this group in its relation to man naturally has the greatest interest for us. I have purposely selected the skulls of two African monkeys to illustrate the dolichocephalic and brachycephalic condi-

the canines in Colobus as compared with Cynocephalus are excellent examples of the changes induced by brachycephaly.

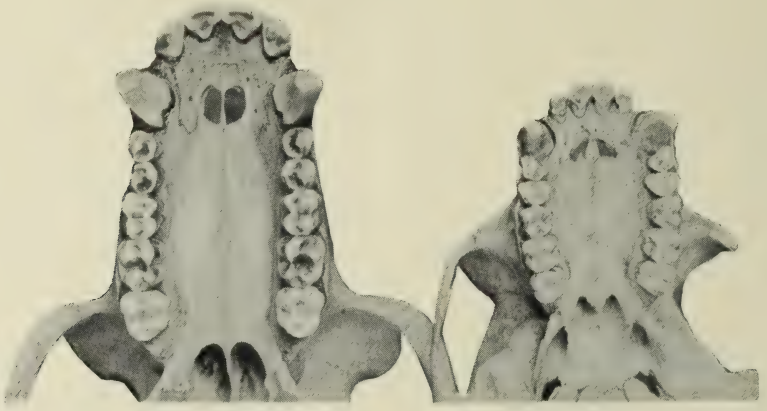
* In the presentation of this paper many slides were shown illustrating these conditions in a number of lower mammals, which it is unnecessary to reproduce here.

The author's thanks are due to the American Museum of Natural History for permission to photograph the skulls shown.

* Dr. C. L. Goddard (1904) in a paper presented before the American Society of Orthodontists, attempted to defend the extraction of normal premolars of man in certain cases by pointing to the difference in facial lines between an old-world and a new-world monkey: "The incisors of the new-world monkey are more prominent than those of the old-world monkey, but why? Count the premolars. The one has three premolars and the other but two (see also his 'Fig. 4'). In two long lines of descent from an ancestor with four premolars the one that has lost the greater number has the straightest profile." Had Dr. Goddard possessed a wider acquaintance with the primates he would not have been misled into making such deductions. There are old-world monkeys with two premolars which are far more dolichocephalic and prognathous than the new-world form he figures. In both the old-world and new-world groups there are long- and short-headed forms.

Examine the palatal views (Fig. 2) of the same specimens and note how the the dental series is affected throughout its length.

Fig. 2.



Cynocephalus. *Colobus.*

skull differences are affected in the arrangement and form of the teeth. These may be thus tabulated:

Now, while keeping in mind these conditions in the lower mammals and in primates with the same type of dentition

	Colobus (brachycephalic).	Cynocephalus (dolichocephalic).
Dental series	Teeth more crowded.	Teeth well spaced.
Arrangement of incisors.	Nearly transverse.	Well arched.
Incisor-canine diastema.	Short.	Longer.
Canines	Round in cross section.	Oval in cross section (mesio-distally).
Canine-premolar diastema	Absent.	A short diastema present.
Premolars	Transverse diameter greatest.	Antero-posterior diameter greatest, no evidence of crowding.
Molars	Nearly square.	More elongate.
	Contactual surfaces greater.	Contact areas less.
	Anterior and posterior cusps approximated.	Anterior and posterior cusps well separated.
	M3 less strongly developed.	M3 well developed.
Anterior palatine foramina	Shorter.	Longer.
Premaxillaries	"	"
Maxillaries	"	"
Palatines	"	"
Zygoma begins	Opposite M1.	Between M2 and M3.

These differences in the upper jaw and dentition are naturally paralled by those in the lower (Fig. 3), and again as the human, let us turn our attention to man himself. Since we are now dealing with conditions within the limits of

a single species, we need not expect to find the differences so great as when we compare species or genera, yet the differences among individuals and races of man are measurable and easily appreciable to the eye. And, what is of special importance, they are the same in kind as those with which we have been dealing in lower mammals.

It is a well-known fact that various races of man differ as regards the cranial characteristic of certain races and varying in the mixed races.

To illustrate how these conditions affect the teeth I have selected four skulls of different races—Australian, Thibetan, Negro, and Indian. Of these the Negro is typically dolichocephalic, and the Thibetan (Mongolian) brachycephalic, while the Australian (Malay) and Indian are mixed. Yet in the skulls before us the Australian is the longest of all,

Fig. 3.



Cynocephalus. *Colobus.*

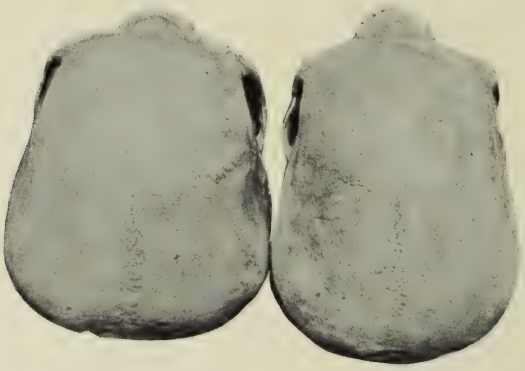
index (the ratio of length to breadth), but the attempts of anthropologists to classify the races of man according to cranial measurement have not proved satisfactory, owing perhaps to a greater or less amount of intermixture (Keane, 1901). It seems to be fairly well established that certain groups, such as the Fijian Kai-colos, Papuans, African Negros, Arabs, and Eskimos are usually dolichocephalic, and typical Negritos, the Mongoloid groups, and Lapps are brachycephalous, while the Malays and American Indians are mixed in this regard. Europeans and their descendants in various parts of the world are naturally much mixed and exhibit a considerable degree of variability. Along with the variations in cranial index there are differences in the amount of prognathism and the Indian (of a Mexican tribe) is the shortest. The general conditions in the long and short head are shown in Fig. 4 (top view) and in Fig. 5 (side view) of the Australian and Thibetan. In Fig. 6 we have shown the palatal views of all four of the skulls, and the differences are most striking. In the Indian and Thibetan the anterior teeth are wanting, but the alveolar process is preserved, giving us the form of the dental arch, and the conditions of the molar teeth are shown. The correlation between the skull length and the form of the dental arch is sufficiently convincing. I may add that when I first began to investigate this question in man, these four skulls were selected for study on the basis of skull length alone, without regard to the teeth or dental arches. Ob-

servations made on many skulls since then only confirm what we see in these four skulls, viz, a definite relation in proportions of dental arch to skull.

We find in the Australian skull, which is the most dolichocephalic, the longest, narrowest dental arch; in the Negro, which is less so, the arch is a little more rounded. The Thibetan is moderately brachycephalic and the arch is rounded, while in the Mexican Indian, having the shortest skull of the series, the dental arch is shortest and broadest.

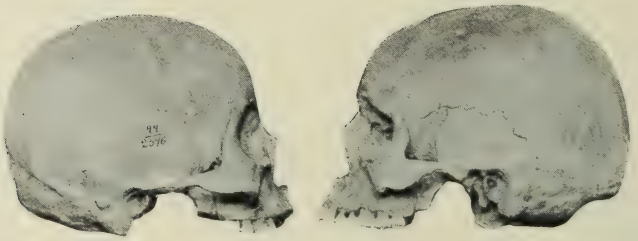
To illustrate the modifications of the

FIG. 4.



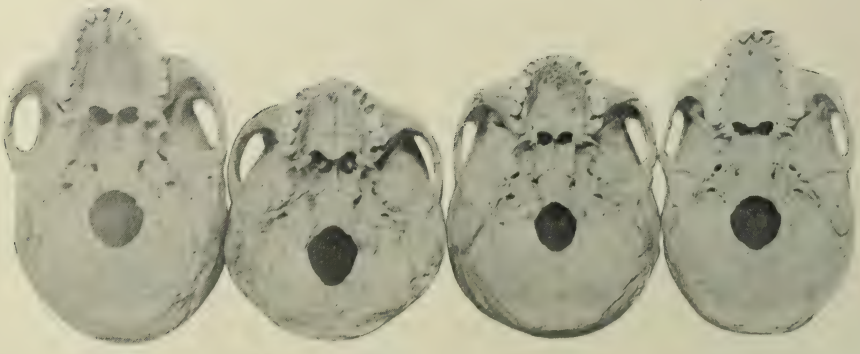
Thibetan. Australian.

FIG. 5.



Thibetan. Australian.

FIG. 6.



Negro. Mexican Indian. Thibetan. Australian.

teeth I have introduced the skull of another Mexican Indian, having more of the teeth present, for comparison with the Australian skull (Fig. 7). In these enlarged palatal views we may observe so many points of interest that we can again best represent them in tabular form:

	Indian (brachycephalic).	Australian (dolichocephalic).
Palate as a whole	Short and wide.	Long and narrower.
Maxillaries	Shorter.	More elongate.
Palatines	"	Longer.
Alveolar border	"	"
Anterior palatine foramen	Rounded.	More elongate.
Opposite dental series	Evenly arcuate.	More parallel.
Arrangement of incisors	More transverse.	More arched.
Canines in cross section	Rounded.	Oval antero-posteriorly.
Premolars	Antero-posterior diameter less.	Antero-posterior diameter greater.
Molars	Shorter in comparison with breadth.	More elongate.
	Anterior and posterior cusps more crowded.	Anterior and posterior cusps farther separated.
	M2 somewhat triangular.	M2 quadrate.
		M3 somewhat triangular.
	M3 absent on one side and reduced on the other.	M3 fully developed.

The teeth of the lower series naturally conform to the upper ones, and some of the differences are shown in Fig. 8. In this illustration the Australian mandible belongs with the skull already figured, but the other belongs to a different skull of a Mexican Indian, selected because more of the teeth were present,* and is only moderately brachycephalic. In these the differences in the form of the arch and in the shape of the teeth are much the same as in Fig. 7. The molars of the Indian jaw are smaller in all dimensions, but all are shorter, especially the third molar, in proportion to breadth. The difference in size of the premolars is very noticeable, and the position of the incisors equally so.

Certain of these differences are even more marked in other skulls which I have seen, especially as the Indian skull shown in Fig. 7 by no means approaches the limit of brachycephaly.

It will be noticed that most of the comparisons above given are relative. Thus in the premolars the actual width of the Australian is greater than that of the Indian, but in comparison with the antero-posterior diameter it is less. The differences in the second premolar are rather characteristic, though not without much variation, and the third molar seems to be more frequently absent and vestigial in brachycephalic skulls, as we might expect if the alveolar border is abbreviated at this point. The inclination of the incisors has not been mentioned. They are characteristically more inclined forward in the dolichocephalic type.

When we compare these differences in man with those of the lower mammals and with those which we have observed in the catarrhine monkeys we find that

* It is a matter for regret that anthropologists in making and caring for collections of skulls have not paid more attention to saving the teeth. In the great majority of the skulls that have come under my observation many of the teeth have been lost, apparently from lack of care in handling or by failure to glue them in when loose.

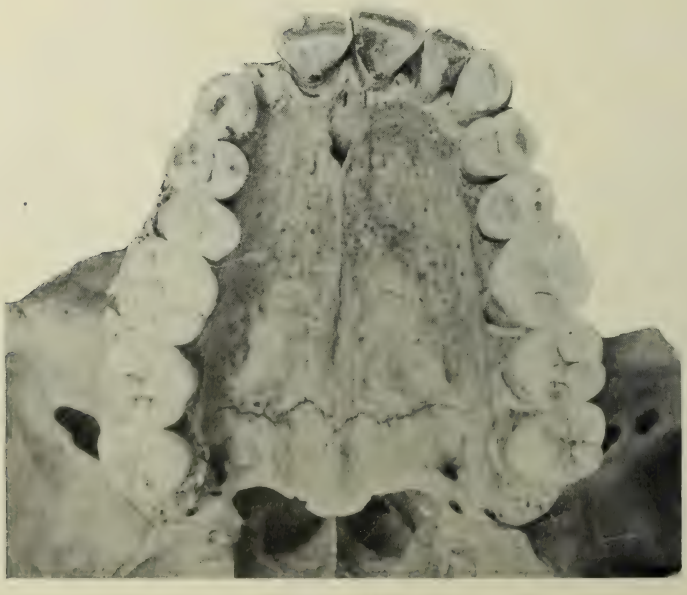
FIG. 7.

A



Mexican Indian.

B

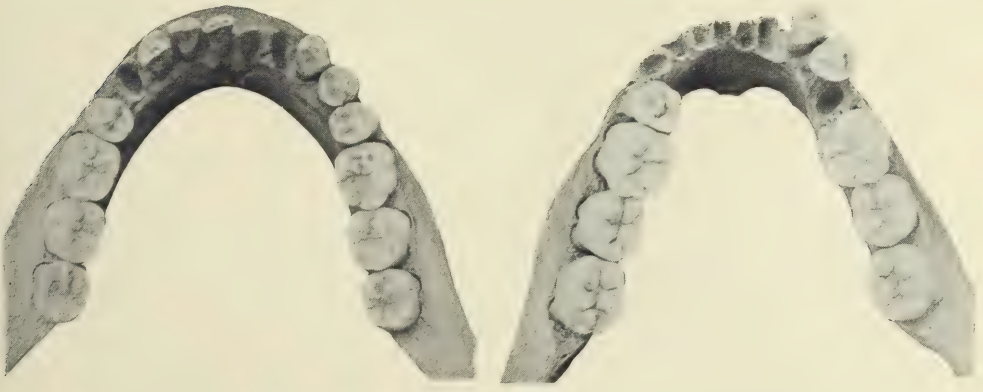


Australian.

they are the same in kind, and since they bear similar relations to skull and other structures the natural conclusion is that they have been brought about in the same manner. The teeth of man are not in a class by themselves, zoölogically, neither do they develop and exist in the individual without the closest relations to other structures. In fact, they merely reflect the whole organization of the individual just as any other portion of the skeleton does. Professor Osborn (1902) has pointed this out in the lower mammals, in the pregnant statement that "The teeth conform to the skull rather than the skull to the teeth." Dr. Angle (1905) has expressed the same idea for man in the following words: "The dental apparatus is . . . only a part of the type of the individual, and is always, in part and in whole and in location, harmonious with the rest of the head and with the type." We may safely assert that dolichocephaly and brachycephaly in man are the expressions of a tendency which runs through the whole class of mammals, and the effects produced on the human dental apparatus by these skull conditions are similar to those produced in other mammals. In man they appear as characteristics of certain races, of certain groups within a race, and even of individuals within a community. The paleolithic ancestors of modern man, according to Keane (1901), were all dolichocephalic as far as known, but this must not be taken to mean that brachycephaly is necessarily an accompaniment of higher mental development. Some of the most degraded savages are extremely brachycephalic, others extremely dolichocephalic, others intermediate, while enlightened races and individuals vary greatly in skull length.

I do not feel called upon to discuss the problems of the orthodontist. I wish, however, to state my belief in the law of correlation, and to observe that when the teeth are present in the proper number and in normal occlusion, the facial outline as far as it is affected by the teeth will be normal for the individual, whatever particular "cast of countenance" nature designed him to have. The orthodontist must not be misled by his own ideas of proper facial contour without considering the type of the individual. The extremely dolichocephalic, prognathous Fijian would probably have as little regard for the facial beauty of the straight-faced Peruvian Indian as the latter would have for that of the former, yet both are normal. To change the one type of face into the other, by whatever means, would produce results as disproportionate in their way as if one were to replace the long legs of the Patagonian by those of the Afri-

FIG. 8.



a Mexican Indian. *b* Australian.

can Bushman. The restoration of malposed teeth to their proper positions in the form of dental arch normal to its possessor calls for all the knowledge and skill of the orthodontist without attempting to improve on nature.

We know as yet but little about the teeth of man from the comparative standpoint. Possibly we may never have sufficient knowledge to follow Cuvier's law of correlation so that we shall be able to reconstruct the entire individual on the basis of a single tooth. I do believe that we shall be able to tell his cranial type and many other of his characteristics, when we shall have pursued these studies far enough. Moreover, I am firmly convinced that a great deal of knowledge having a direct practical application in orthodontia is certain to arise from such studies.

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INSANITY CAUSED BY PAINLESS DENTAL DISEASE.

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(Read before the Seventh and Eighth District Dental Societies of the State of New York, Buffalo, October 29, 1909.)

I AM much indebted to the members of this society for the opportunity of addressing them on a subject which I believe to be of great importance. In endeavoring to present to you in a few examples the effects on mind and nerve of some of the commonest of the dental diseases, it may be well to pass briefly in review the forms of insanity of which I speak, the relations that I have found to exist between mental symptoms on the one side and irritations of the teeth and jaws on the other, and to consider which if any of these views are new.

In studying the different forms of insanity the first impression of the subject is usually that of its great complexity. Cases resemble each other so much that one type merges into the other, and yet no two cases are quite alike. It is possible, however, to simplify the cases by classification, and it is my purpose to-

day to exclude cases due to organic brain disease, as for instance tumor and sclerosis, and those due to alcohol, syphilis, and other known poisons, and to consider what are called functional insanities, that is, mental aberrations not due to organic disease in the brain. These cases occur in great number; they fill our asylums, and many of them end in hopeless dementia. Almost all of these patients have symptoms much more active than simple loss of mental power. In fact, their typical features are emotional outbreaks of depression or elation, worry, anger, fear, and accompanying these disturbances of feeling, and I believe secondary to them, there may be delusions and confusion of thought, with a final loss of mental power, so-called dementia, due to exhaustion of the vital forces of nerve and of mind. The way in which these elements which go to make up the picture of insanity are combined varies infinitely in different cases, and varies according to age. There is one time of life when a large proportion develop, and to this period I wish to direct your especial attention, namely, the period of adolescence, from fourteen to twenty-five years.

A division of these cases into melancholia, mania, and dementia præcox is convenient, but is not vitally important compared with the discovery of their causes. The groups are at best not sharply defined, and the fact that authorities differ so widely in their classification constitutes at least a presumption that the differences between the several classes are of detail rather than of kind.

I am convinced by investigations carried on during the past three years that these cases are due to irritation of the sensory nervous system, often painless, and that the teeth and jaws are a common seat of the irritation, corresponding with the fact that dental disease is one of the most frequent of all bodily ills. The fact that disease of the viscera may cause melancholia and mania is not new, but that the mental symptoms arise as the result of pure irritation is a new idea. It is new to suppose that dementia præcox is irritative in origin, or ever due to a lesion in the teeth.

From the dental side the suggestion is a new one that serious dental disease may cause no pain, and that such painless disease often has far-reaching and disastrous results. It is new to suggest that dental impaction is common in insanity, or that it is the cause of any mental symptoms whatever, or any nervous symptoms aside from pain.

Incidentally, another fact is apparent in connection with every one of the cases to be reported; the fact that skiagraphic diagnosis is necessary as a preliminary to intelligent dental treatment, and as a safeguard against disaster alike from treatment and from disease.

Of 58 cases of nervous and mental disease seen by me recently in consultation and investigated by skiagraph, 32 have shown impactions, single or multiple. Many of these cases were entirely painless; in not one was there pain confined to the region of the impaction. In three cases there were times when all of the teeth gave a moderate dull pain, not attributed by either patient or dentist to any dental disease. Of these 58 cases 9 cases of dementia præcox were operated upon dentally; 6 have recovered, 2 cases are improved, and 1 remains unimproved.

Among the nervous and mental aberrations consequent on irritation, dementia præcox is one of the most important, by reason of its commonness and of its distressing and destructive character. For purposes of demonstration cases should be limited to those treated early in their course, within, for instance, the first six months. Many cases, possibly the majority, will well repay treatment later than this, but it should be borne in mind that in its most rapid forms dementia præcox is soon disastrous to the tissues of the brain; mentality becomes speedily moribund, and in this stage of dementia the outlook is as hopeless as it is in diphtheria or consumption, with the patient already in the grasp of death. At that late stage no favorable results of treatment can be confidently expected. This has become apparent to me in my

investigations in the Cleveland and Columbus state hospitals. The cases here reported were seen in private practice, most of them not yet in the hopeless stage. The patients to be more fully described in this paper suffered mainly from extensive caries and alveolar abscess, lesions which afford an equally important field of endeavor with impactions, but more difficult because more complicated.

Cases.

Case I. The observation which led me to the investigation of impaction and other dental lesions was made in a case of severe toothache due to pericementitis, in a tooth with a large filling and a dead pulp. The patient was melancholy and sleepless, but chiefly so when the pain was not severe, and these two symptoms were obviously independent of the pain, and set up directly by the lesion. Recovery followed extraction of the tooth.

Case II. A patient was then encountered suffering from the same symptoms, but even more sleepless and depressed, and with the restlessness which is typical of toothache and melancholia alike, but with no pain anywhere, and no history of a preceding toothache for many years. The case was one of typical simple melancholia. The patient recovered promptly after the filling of a cavity which extended into the pulp-chamber.

Case III. The next patient in the series suffered from the same mental symptoms, but of longer duration, two years, and there were profound delusions of sins committed and of hopeless disease of the brain, from which she thought that she could never recover. There was in her case no caries, but an impacted upper third molar. Its extraction almost three years ago was followed by steady recovery, and the patient remains well, mentally and physically. I saw this patient with Dr. W. H. Humiston, and later with Dr. J. F. Stephan and the house staff of the Lakeside Hospital.

The three following cases have been observed comparatively recently. (The cases treated earlier—cases VII–XII—have been published elsewhere, and will be given in abstract.)

Fig. 1. (*Case III.*)

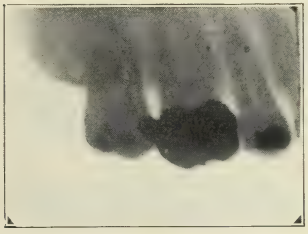


Case IV. The patient was a woman, twenty-seven years of age. She had been married about two years, was perfectly well, although not of robust build, and of unusual intelligence and lively perceptions, was well educated and of happy disposition. One day, about the middle of May in this year, it was noticed that she was somewhat incoherent in her talk. Her mother, who was with her, became alarmed and took her home, where I saw her a week later. The progress of the disease had been so rapid that after even this short interval her mental aberration was very marked. She had been sleepless night after night, only sleeping when given hypnotics. During the day she was excited, talked incessantly, and broke down and cried frequently. She put her hand often to the left side of her head, but denied that she had any pain anywhere. On questioning her parents I found that she had never had a toothache, and had not been subject to headaches. During the next two weeks her condition remained the same, except that the restlessness and voluble talking were if anything rather more marked. Three weeks after the onset of the disease the patient was talking incessantly, with entire incoherence, and with very dramatic gestures. She cried frequently, without reference to what she happened to be

talking about, and spent the greater part of the time walking about her bed, and at times crouching on it on all fours. After her recovery the room below had to be replastered.

Her incoherence is apparent from the following remarks, which were taken down verbatim as she uttered them:

Fig. 2. (*Case IV.*)



Upper left molar region.

Fig. 3. (*Case IV.*)



Lower right molar region.

Now I know the story of vaseline and I don't know what lean means and I don't know what fat means. Then I'm three cents and I'm the standard stores, because I'm just my husband, and he won't let me go to 105th st. Let's see, were't you away? You were Frau Lansberg when you came back. I was paid for my Thackeray, and that's my real linen, and I'm only twenty-two, but I'm twenty-five to her, and I'm two to you. So I said I won't burn any more mahogany. I can't speak any more Deutsch till I came back two years ago on the "Deutschland." Nein nichts mehr. Helen salutes. Oh, I wouldn't be a criminal if I knew what I'd done. That's all the catarrhal bronchitis I've ever had. When I graduated he was in the Hatch Library, and I can't be real to you, you know, because I robbed and robbed, and I came from Toledo, because that's where my first ball game started, so I haven't been myself since I've been here, and I'm Mrs. Porter, and now I'm nobody.

Even more remarkable than this incoherence was its ceaseless energy. She had also to be continually watched to keep her from leaping from the window. Constant activity and refusal to take adequate nourishment caused her to lose flesh rapidly, and her color was correspondingly bad. Examination revealed no physical condition of any of the internal organs which could account for her mental condition, except that some of her teeth were badly decayed. Skiagraphic examination showed no impaction. There was no evidence of abscess at the roots of any of the teeth, but simply decay and one or two large fillings somewhat near the pulp. As these conditions were obviously capable of causing a good deal of irritation, on June 6, 1909, the lower right first, second, and third molars, the upper right second molar and second bicuspid and the lower right third molar and upper left first molar were extracted.

On examining these teeth after their removal it was discovered that under a large amalgam filling in the upper left first molar decay had occurred in contact with a living pulp. The lower right third molar was badly decayed into the pulp. The pulp-chamber of the upper right second molar was filled with pulp nodules. In the lower right second and third molars there were large fillings near the pulp-chamber. The remaining teeth which were extracted were more or less decayed.

These lesions were obviously profoundly irritating, though their seriousness was not entirely apparent in the skiagraphs. Especially in the upper left first molar the skiagraph showed only the presence of a large filling, which did not seem to be near the pulp-chamber. This serious lesion might easily have been overlooked, and in fact the tooth was only extracted with the idea of being absolutely sure to remove all irrita-

tion in an unusually serious and important case. If this had not been done I am satisfied that the patient would have remained unrelieved of the irritation, and that her mental condition would have remained the same or grown worse.

Within two or three days after the teeth were removed, the patient was somewhat quieter. She began to take nourishment more readily, and day by day improved in strength, and within a week was much quieter and at times more coherent. Sleep, however, was still a good deal disturbed, and she had to continue taking hypnotics for several weeks. Within a month after the operation improvement had become so marked that the patient was out of doors, able to play croquet, was eating and sleeping well, and her conversation was in the main rational, although she would occasionally drift off into incoherence. Within a week or two after this, six weeks after the operation, conversation was quite coherent, and the patient has since made a full recovery. She has regained both bodily and mental health. Dr. Fannie C. Hutchins, a former physician of the Cleveland State Hospital, to whom I am indebted for the opportunity of seeing this case, concurred in the diagnosis of dementia præcox.

Case V. The following case illustrates not so much the perfection of knowledge obtained by skiagraphic study, as the difficulties that must sometimes be contended with. Cases like this one, dependent not on impaction but on more or less diffuse disease involving many teeth, present at times great difficulties of diagnosis.

The patient was a married woman, twenty-eight years of age. Four months before she was seen she was much depressed at the receipt of some bad news, and became gloomy and uncommunicative. Up to that time she had been well, except for a moderate amount of uterine trouble. With her depression came sleeplessness, and she was restless and nervous, complaining constantly of a feeling of pressure at the back of the head. She had, however, no acute pain in the head, and no toothache or other pain. Her appetite was poor, her color pasty, and with her morbid feelings she had delusions that she was being punished for sin, and that there was no hope of her recovery.

She not only suffered no pain, but complained bitterly that she was incapable of pain, and with this had a firm delusion that she never lost consciousness for a moment day or night.

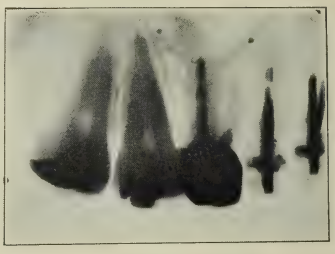
Examination in this case by Dr. Geo. W. Crile showed no pelvic disease, except an infantile uterus. Otherwise there was practically a normal condition of all of the organs except that many of the teeth were dead and had been crowned. In addition, in the lower jaw there were bridges in the molar regions on both sides. Skiagraphic examination showed at the roots of many of the dead teeth

Fig. 4. (*Case V.*)



Upper left canine region.

Fig. 5. (*Case V.*)



Upper left molar region.

evidences of slight irritation, but this in no case gave the appearance of an abscess of any considerable size. If the symptoms had not been so threatening, it would not have been thought advisable to extract so many teeth as were here under suspicion. The mental condition, however, was so serious that it was decided to remove all of the upper teeth, which was done in January 1909.

The patient's state of mind at about the time of the operation appears from the following letter, written to her brother from the hospital. The abrupt beginning and lack of signature are significant of the entire absorption of the patient's mind in her delusions:

Dear Jim,—The future is too awful to contemplate. I know what will become of me. I'll fall into the sea, but instead of being drowned and unconscious like other people, I'll be conscious and go to the bottom among all those dreadful sea monsters. There's no turning back. My sleep has always been a horrid unrefreshing one, a very heavy kind due to my bad liver, which I must have been born with. The nurse says she never saw such a furry tongue as mine. She scrapes and washes it every day, and imagine, it's been that way for twenty-nine years. I can never be better and sleep has gone forever. I'll live on and on long after everybody else is dead. Oh, it's awful, awful!"

In another letter she says:

I am still here and haven't slept a wink since I saw you. I don't lose consciousness for a minute, and all my nerves are at an awful tension. It's dreadful, every jar and creak cutting right through me, and nothing can be done. I can't even die. Nothing has any effect on me, drugs or morphin, just as if they hadn't given it to me. All night long and all day long I lie here and hold myself back, not a wink of sleep. Oh, it's awful, the end worse than the beginning; never to see anybody again except in hell. I'll just live on and on with never a rest and never a wink of sleep. Can you imagine the dreadfulness of it? I look like a person of ninety, eyes sunk away in, and live on and on. I know you will not think it so, but it is. Nothing to be done and no help. The doctors come in, look at me, and pass out, still no help. Nothing quiets me, can't even be etherized, felt everything going on, eyes wide open all the time. Oh dear, not to have known a well day and now never to know one. Isn't it dreadful? Oh, it's agonizing to have nothing to look forward to but disaster and eternal punishment. Oh if I could just close my eyes a minute! but no rest night or day.

Following the operation the patient was kept in bed, and for several days her condition was unchanged. When she was especially nervous she lay on her face, or crouched on all fours. She picked at herself a great deal, was so occupied with her delusions that she did not respond quickly or readily to questions, and showed very little feeling of affection for the members of her family. Within a week after the operation, however, sleep began to improve, and she was brighter and less depressed. Improvement continued for about a week, when as the result of an indigestion or for some other reason unknown she had a slight relapse, but was at no time after the operation in as bad condition as before. At this time a blister was put on the back of the neck, and she was given hypodermic injections of pilocarpin. These measures quieted her; improvement began again and was steady, until recovery was complete about two months after the operation. She is now cheerful, active, and except for occasional headaches is well mentally and physically.

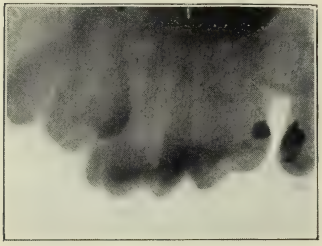
Dr. Geo. W. Crile and the house staff of the Lakeside Hospital saw this patient with me.

Dental operations if ill-advised may, instead of relieving, cause irritation, and the evolution of consequent mental symptoms is as instructive as if produced experimentally in a laboratory. The following case illustrates this point:

Case VI. The patient, a young woman twenty-four years of age, began to be very much depressed, and to manifest signs of failing mental power, typical of dementia præcox. Skiagraphic examination showed several impacted teeth, which were removed. Improvement began and was steady; the patient's color became much better, she gained in weight, and was cheerful and normal mentally. At this time a dentist in-

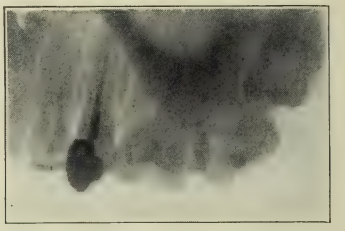
cautiously exposed the pulp of a tooth and capped it without devitalizing. This is one of the most disastrous of all dental operations. In three days the patient became violently insane, and remained so until the tooth was extracted three days afterward, when improvement once more began, and was continuous until she had regained her former point in convalescence. The case is a recent one, and the ultimate outcome must therefore remain in doubt.

Fig. 6. (*Case VI.*)



Upper left molar region.

Fig. 7. (*Case VI.*)



Upper right molar region.

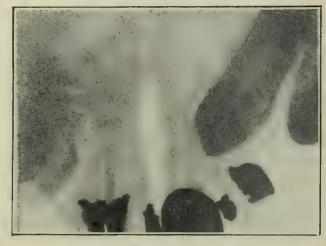
EARLIER CASES.

As the earlier cases have been reported elsewhere, they will here be given in abstract. The four following cases are of special significance, as they are due to impaction, and improvement began in each case within ten days after operation.

Case VII. The first dementia præcox case was that of a girl nineteen years of age. She was first seen in October 1907. For ten months before the operation she had been drifting deeper into incoherence, with delusions. For two months she had been restrained by being tied in bed day and night. Two or three times she escaped, tore off her clothing, and ran down the street naked. She was constantly agitated, sleepless, and muttering. Without an anesthetic no examination of either teeth or pelvic organs was possible. Opinion, however, was given that her insanity was due to an irritative lesion somewhere. The case was considered a severe test of the irritative theory of dementia præcox.

There were gathered at the operation Drs. Lower and Crile for examination of the pelvic organs, Drs. Lodge and Hill for the making of skiagraphs, and Dr. Jno. F. Stephan to do any extracting which might be necessary. In addition there were present the house staff of the private-ward service of the Lakeside Hospital of Cleveland. All four molars and a lateral incisor were found impacted. Skiagraphs were taken and extraction performed under ether in December 1907. Five days after the operation, and before there had been time for perceptible improvement, the patient loosened her bonds at night, and leaped from a third-story window, thirty feet to the frozen ground below. No bones were broken, and she made a gradual but complete recovery. She is now mentally sound, and has only occasional headaches, and at times moderate insomnia.

Fig. 8. (*Case X.*)



Upper right canine.

One of the mistakes incident to the application of a new method was made in

this case. The lower left first molar was dead and had a very large overhanging filling, which should have been removed, and which in all probability is the cause of her headaches.

Case VIII. This is a case of dementia præcox in the early stage, of the type which often leads to habitual criminality, with later development of the typical dementia. The patient was a bright and previously healthy boy of sixteen. For a year he had been nervous and sleepless, and showed much less affection for his family than formerly. His moral sense was considerably blunted, and on several occasions he had appropriated articles not belonging to him. He had begun to be intractable, punishment being no longer of any avail. The element of incorrigibility is typical in these cases. The patient's third molars were found to be impacted, and were removed. He made a rapid recovery, gained physically and mentally, and is affectionate and doing good work in the college in which he is a student. He has headaches, which began some months after the original operation, apparently coinciding with the development of ulceration of a tooth, which still remains in the upper jaw. I am indebted to Dr. J. D. Jones for the opportunity of seeing this patient.

Case IX. Another case is one typical of the partial form of dementia præcox, in which the symptoms, though at times severe, are remittent. The attacks, consisting of insomnia with great restlessness and irritability, mild delusions, and at times catalepsy, and the peculiar obstinacy of the catatonic state, occurred once or twice a year and lasted for several weeks or months. During the intervals the patient was irritable and hard to get along with. The upper left third molar was found impacted at a low angle, and was removed. Improvement was immediate, and after the remaining teeth, many of which were decayed, were attended to, recovery was complete, and has remained so ever since —for more than a year and a half.

In none of the preceding cases was there any toothache.

Case X. The following case was of even more significance than the two preceding ones. The patient had been somewhat expansive and erratic for four or five years. When first seen he had suddenly passed into a condition of silly laughter, and was incoherent in his talk and actions. His condition at that time seemed to warrant a diagnosis of chronic followed by acute mania. The upper right bicuspid was found badly impacted, and was removed. The patient was sent to the Cleveland State Hospital, where a diagnosis of the paranoid form of dementia præcox was made. He made an uninterrupted recovery, and remains well. In this case one or two dead and irritated teeth had given pain, but none could be traced to the impacted tooth. I am indebted to Dr. I. J. Goodman for this patient.

In two cases the results have not been so favorable:

Case XI. The patient was a boy, nineteen years of age, the subject of typical hebephrenia, which began with symptoms strongly indicative of intestinal poisoning. Skiagraphic examination revealed no serious lesion of the teeth. One of the third molars, however, was not quite in line with the second, and although the opinion was expressed that this was probably not responsible for the symptoms, the tooth was drawn as a precautionary measure. Following the extraction a persistent twitching of the left side of the face ceased, but otherwise the symptoms remain the same. This is the one unimproved case.

Case XII. Another patient was seen about six months ago. She had been for some months under the care of Dr. A. B. Howard, former superintendent of the Cleveland State Hospital for the Insane. Although she came under my care somewhat indirectly, I am largely indebted to Dr. Howard's courtesy for being able to study this case. The patient was in a markedly disturbed condition, and presented symptoms typical of dementia præcox of the hebephrenic form. It was difficult to obtain films, and a large plate taken of the whole head gave no adequate information of the condition

of the teeth. About a dozen badly decayed and ulcerated teeth were extracted on the chance that these might include all the serious dental disease present. For ten days her condition was improved. She was quieter and slept better. She was then taken away from the city, and I have not seen her since. For a time the report was not good. Later reports indicate considerable improvement, and the outcome of the case is in doubt.

Among the objections to the views here outlined I believe that the principal one is the extreme reluctance of most physicians to think that mentality is dependent on the good or bad condition of the teeth. This is without doubt an idea surviving from the dualistic conception of the universe, viz, that matter being one thing and mind another, the soul must be and is independent of the body. Modern science has already thoroughly disposed of this medical theory. The abolition of mental integrity by such physical particularities as typhoid germs, motor-car impacts, and a thousand other manifestations of force, makes a discussion of the special application to dental lesions superfluous. This point of view is of importance, however, as it determines and has in the past determined an attitude of hostility to the experimental method, the weighing of observed facts in the study of mind.

More special objections to the validity of the cases here cited are that many such patients recover spontaneously, or under other and varied forms of treatment; that the milder cases may have recovered by virtue of the effect of the dental procedures on the imagination, and that in the severer cases the diagnosis may be in error and the prospect of recovery in those cases good in any event, and by other means. In answer it may be admitted that many patients afflicted with nervous and the milder mental disorders do recover in various ways, and that suggestion by dental treatment is to be reckoned with, as it is when electricity is used or drugs are administered. As regards the diagnosis of these cases, the judgment of any individual observer is without doubt fallible, and although much has been done in recent years in classifying the different forms of insanity, the subject is still in confusion, and authorities differ widely. It may be well, therefore, to consider briefly from what if any of these cases it is safe to draw conclusions, and what criteria are to be applied in judging them.

With regard to diagnosis, these cases have been seen by many competent men, and in several of the worst of the cases of dementia præcox the diagnosis has been made and the cases have been watched with me by physicians and former physicians of state hospitals for the insane.

Demonstration, whether clinical or by laboratory experiment, is best carried out not haphazard, but in carefully selected cases. Most conclusive are cases of the severer diseases, with typical lesions. Of the many disorders, nervous and mental, resulting from dental disease, that called dementia præcox is the most convincing in view of its violent, stormy course and the promptness of its response to operative treatment. It is not curable by suggestion. Of the various dental lesions noxious to nerve and mind, impactions are the simplest in kind and the most profoundly irritative in effect. Choosing severe typical cases of dementia præcox, early in their course or within a few months of the acute onset, in many of them, possibly in about one-half, there will be found impactions, as shown by skiagraph. Removal of these and at the same time of all co-existing irritants, as abscess, profound caries, or exostosis, has proved curative in so large a percentage of the cases as to establish, in my opinion, the causative relationship between lesion and mental symptoms.

The objection is sometimes made to the origin of nervous and mental diseases in the viscera of the mouth, abdomen, or pelvis, and their treatment by removal of irritation, that these diseases are hereditary and in the blood. Such patients are on this ground considered hopeless and sent to the asylum. This is much like refusing to cure patients of

tuberculosis for the reason that they are susceptible to that disease, or to object to curing patients of headache because they may have a recurrence from the same or other causes.

The value of a method of relief is not dependent on the absence of predisposition on the part of the patient; it is not conditioned on an ability to confer immunity from succeeding attacks. If this were so, quinin, diphtheria antitoxin, and most of our other remedies would share in the general condemnation.

It is of interest to inquire whether dental irritation is consistent with health; whether, in other words, there may not be many people who have serious dental disease without nervous or mental consequences. In answer to this question it may be said that man maintains his place in the universe by resistance to the various noxious agents to which he is subjected. Immunity to infection, endurance of fatigue, capacity to withstand the action of poisons, and tolerance of irritation, all vary in different individuals, not only in degree but in kind. Some people when irritated become emotional, others are intellectually disturbed. Irritation gives some persons an indigestion or diarrhea, others vasomotor phenomena, fever, and so on. Serious dental irritation may for long be endured without harm by some individuals. Even the impactions in the cases here reported were existent and active, some of them for years, before giving distinct evidence of their capacity to make trouble. The most serious lesions in degree and kind will ultimately overwhelm even the strongest; the more susceptible are not by their susceptibility necessarily rendered undesirable members of the community. Sensitiveness of response is an attribute of some of the most gifted persons, and is a quality necessary to certain kinds of excellence. Again, occasional latency of a lesion furnishes no presumption that it is harmless. Even the infectious diseases lurk in the system often for long periods without giving signs of their presence. Tubercles may exist in the lungs or in the brain, and the germs of diphtheria and of pneumonia in the mouth indefinitely without apparent and sometimes without ultimate disaster to the one who bears them.

These considerations, in my opinion, dispose of the objection that many persons have badly diseased teeth without being either insane or nervous.

ODD CASES.

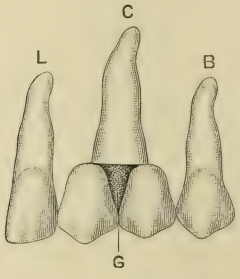
By JOHN GIRDWOOD, D.D.S. (Univ.Pa.), Edinburgh, Scotland.

AS an exposition of system, incidents of practice do not hang well together, but as they constitute none the less in the main the average practitioner's daily work, much may be learned from them. It is not always easy to call up a group of cases on one or the same subject, and as our office practice is varied and many-sided, so must the record of our experiences be disjointed.

The advent of the inlay furnace in its more modern and perfected form has brought about a change in methods which later, and in its own sphere of application, has been almost surpassed by what are known as casting processes. Porcelain work, which was for so many years confined to inlaying, has more recently spread itself into other domains, as has casting, and this will be my apology for citing one or two cases in which the wider scope of these two processes made the difference between failure and success.

Case I. The following case presented itself in my practice some time ago: A bridge anchored anteriorly on a second bicuspid on the left side of the upper jaw had in front of it a badly broken-down canine. The first bicuspid having been removed, this canine had moved backward, but was not in apposition with the mesial surface of the post of the bridge above mentioned; it stood by itself with a space in front between the left lateral incisor and its mesial aspect, and similarly behind it an interval ex-

Fig. 1.



C, Canine root. L, Lateral. B, Second bicuspid. G, Pink gum body between facings.

isted between the anterior post of the bridge and its distal surface. In other words, the canine root stood in the interval which normally should have been occupied by two teeth, and the problem which presented itself to me was to fill that space with a canine facing and one which would represent the first bicuspid.

The canine root was treated in the usual way, capped and banded with platinum, a platinum post being fitted and soldered with pure gold, but it was ground flat from lingual to labial aspects and not saddle-shaped to follow the festoon of the gum. Two porcelain faces were fitted on this cap, the mesial one extending mesially forward to meet the lateral incisor, and the distal one projecting distally to meet the anterior post of the bridge. This left a space normally occupied by the canine and first bicuspid filled artificially by these teeth facings, but there existed between their cervical edges and the gum a triangular space corresponding to the labial aspect of the canine root. After the facings had been attached to the platinum cap, the labial triangular space on the canine root cap was filled in with gum body so as to cover the metallic surface, and fired. The result was not unpleasing. (Fig. 1.) Anteriorly the canine facing was in contact with the natural gum, posteriorly the bicuspid facing was almost as well positioned, and between the two the porcelain gum body hid the metal cap which supported both.

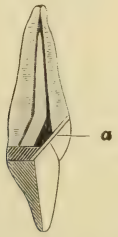
There exists in the minds of many practitioners a doubt as to whether a single root should ever be called upon to carry two facings. Without presuming to discuss this vexed question in all its phases, one may say that where one facing acts as a lever upon the root carrying the second, such a thing is not desirable; where the two are more equally balanced, they really occupy the position of exaggerated coronal contour, and the same objection does not hold good as in the case just referred to. In my patient's mouth, the work on the upper left canine root was evenly distributed mesially and distally, and experience has so far proved that the experiment has been justified.

Artificial crowns which occupy their normal position in the dental arch may pass for natural teeth readily enough, but when they stand outside the normal articulation it is hardly possible to conceal the fact that art has been at work. In this connection the porcelain furnace has again come to our aid, as I think the following case will show.

Case II. Mrs. M. presented herself with the following conditions: The upper right canine root stood outside the line of the adjoining teeth; the lateral incisor and first bicuspid were normal and sound, but the canine was badly decayed and crowning was rendered necessary. I ground down the root labially well below the gum margin, but left the lingual surface high. I pushed away the gum labially with gutta-percha for a few days and again ground down that surface still farther. A half band and cap of platinum were now fitted and burnished to the surface and outer edge

of the root in front, the canal was reamed almost to the lingual edge, and a post bent inward and attached to the half-cap in that position. A porcelain facing was next fitted and made to occupy a position on the cap in line with the adjoining teeth, that is to say, its labial surface came no farther forward on the half-cap than the normal position of the pulp-canal of the root. The labial half of the diaphragm was thus left bare, while the facing occupied a position around it; in fact, after the facing had been adjusted the root was half of its diameter outside the normal arch. The facing was soldered with pure gold to the cap, and the labial root-surface was covered over with gum body mixed to match the natural gum in color. The

Fig. 2.



a, Platinum burnished over end of root with gum-colored body fused over it.

result of this operation was very successful. The lip half covered the artificial gum which hid the metallic surface of the cap, while the facing occupied a position so near the normal as to disarm criticism. This case is not easy to describe, but the diagram (Fig. 2) will explain what is meant.

Case III. This was a lower right first molar very considerably tilted forward owing to the early loss of the second bicuspid, somewhat loose, and decayed well below the gum on the distal and for a considerable distance similarly on the buccal aspect; all, indeed, that remained of the natural tooth was the anterior approximal and part of the lingual walls supporting the mesio-lingual cusp. The roots were considerably absorbed, and the tooth a trifle loose. Here was obviously a case which would not bear much handling, and where the adjustment of an all-gold or porcelain-faced crown would have presented serious difficulties, because of the impossibility of fitting the band accurately to

Fig. 3.

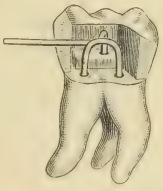


the root; moreover, the grinding necessary for making a banded crown would still further have weakened an already too frail fragment. As the patient attached much importance to its preservation, principally on account of appearance, I decided to treat it thus: Having treated and filled the canals and removed all decay, I cut a step in the remaining portion of the sound dentin of the crown and in it drilled a shallow pit $1\frac{1}{2}$ mm. deep. I similarly drilled into the filled roots and thus secured three points of anchorage for retention. (Fig. 3.) I then took a dental alloy wire, size 15, bent it into the form of a U, and fitted its free ends into the root-canals; to this I soldered another piece of wire at the bend of the U, and fitted its free

Fig. 4.



Fig. 5.



end into the pit in the above-mentioned step. This gave me a tripod of wire for anchorage, and at the junction of its three legs I soldered horizontally and posteriorly a staple of wire, which held the whole firmly in the investment later. (Figs. 4 and 5.) A molar facing was

fitted against the anterior buccal enamel edge and adjusted to the bite to represent the missing buccal wall. The wire tripod and staple were placed on the model, the pins of the facing having been bent, and the facing was then set in position, and the whole waxed up and contoured to the original shape of the tooth. The facing was kept about 1 mm. clear of the cervical margin, so that the metal which was to form the crown should fill the space between the root and porcelain and be in close adaptation to the root-surface. The whole was then invested like an ordinary inlay, and cast, not with gold, but with pure block tin. The result was a partial crown in tin reinforced internally by heavy dental alloy wire anchorages. (Fig. 6.) The wire staple

Fig. 6.

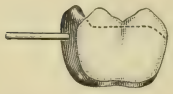


Fig. 7.



which held the piece in the investment was cut off, and the partial porcelain-faced tin crown finished, polished, and cemented to place. (Fig. 7.)

The result equaled all that it was possible to do with such a bad case under the circumstances, and as such was very satisfactory. It was not of course the treatment which one would employ in a case that would admit of more thorough measures, but where from similar causes one is precluded from doing the best, this method will be found an excellent second.

Case IV. (A new method of staining teeth.) The staining or artificial teeth by mineral colors has long been at our disposal, but the use of permanganate of potash in this connection I have not seen described elsewhere.

A good many years ago I was called upon to make a full upper set for an old man of eighty years of age. A set of S. S. White natural pattern teeth —suitable in size and form, but much too light in color—was chosen. (When will manufacturers condescend to give us proper colors?) I gave instructions that these should be colored minerally in the ordinary way and fired, but by an oversight in the laboratory this was not done, and the case was finished before I had discovered the omission. Obviously I could not insert a set of glaringly white teeth for a man of my patient's age, and as the denture had to be put in at once, no time was available for correcting this fault. The indelibility of permanganate of potash stain came to my mind and I determined to try it, bearing in mind how difficult it is to remove such a stain from an ordinary porcelain dish after it has stood for some time. I removed the superficial glaze—which, by the way, is not absolutely necessary—by means of a Scotch stone, and made three applications of permanganate, observing an interval of an hour between each. This was sufficient to produce a stain as brown as was necessary. The color was not evenly distributed over the surface of the teeth, and care was taken to vary the strength and amount of the stain. Before each additional coat the teeth were washed thoroughly, using a hard brush, thus removing all unabsorbed stain. I need hardly say that the stain was made deeper than one expected it to be permanently, to allow for a certain amount of superficial wear. Since that time, now many years ago, I have adopted this plan in a great number of cases of crown, bridge, and plate work with marked success. By heating the tooth after each application of the permanganate the process can be carried through in a much shorter time, but when the time can be spared, it is better to do it as described at first. The brown staining caused by permanganate requires to be made deeper in a fused tooth (English) than in a molded one (American), and the amount of staining necessary, and the intensity which one may calculate will be permanent has to be gaged by experience. One cannot of course produce on a very white tooth every dark color desired, but

it is surprising what range of application the single brown color is capable of. A very obvious application of this simple expedient is to be found in fixed crown and bridge work. One frequently sees a crown, particularly in smokers' mouths, which had been inserted in early life and of course has not darkened like the natural teeth as the patient has grown older, and which is accordingly out of color harmony with the rest of the mouth. Such a crown or bridge can readily be toned down by isolating it first with the rubber dam and proceeding to apply permanganate of potash as described above. The color produced cannot always be *exactly* what we want, but at all events it removes the look of palpable artificiality which in such a condition is so striking.

RIGGS' DISEASE.

By JULES J. SARRAZIN, D.D.S., New Orleans, La.

(Read before the First and Second Congressional Districts Dental Society of Louisiana, January 26, 1910.)

IT seems to be a decided error to espouse an uncompromising theory that Riggs' disease is either local or systemic, without recognizing the fact that some cases of the ailment are of local origin, while others have systemic causes, and that the latter are hopeless unless the general pathological condition be successfully corrected; nor is it impossible to distinguish systemic from local cases by the conditions presented in the oral cavity considered in connection with the physical condition of the patient.

The separation of soft tissue from the roots, but with no pockets extending very deeply upon or all around the root circumferences, and calculi in small chunks, on which instruments stumble, usually indicate a purely local affection. Irritation resulting from salivary calculi, defective metal ferrules, protruding cervical fillings, impaction of food, malocclusion, or a combination of these, has produced the local inflammation, causing stagnation of the circulation in spots, whence the separation of soft tissue layers and the deposition of serumal calculi on roots in small chunks, not far from the tooth-necks, just because the circulatory stagnation was not general and occurred near the irritated surface. Of course we may find pus present in such pockets, although shallow ones, but these cases may be handled with less difficulty. On the other hand, the presence of pockets so deep that the alveoli are felt, forming their periphery, where serumal deposits are not well defined, and the frequently noted condition of a frost covering the roots on all sides, sometimes extending their entire length, show that the circulatory stagnation was general, that its cause was not a peripheral inflammation, and that the etiology was systemic. These are the cases which present the least flow of pus, although the alveolar peripheries are diseased, more or less carious, and must be curetted, if not actually burred. These cases tax the skill of the stomatologist, because the tactile technique must be more accurate than ever, while local treatment can procure but temporary benefit, unless the underlying pathological defects be remedied at the same time. Again, local cases may offer the shallow-pocket conditions above described on any surface of the roots, without any special predilection, while

systemic cases will show their deep pockets preferably on the approximal surfaces of the roots and at the bifurcations of the molar and first bicuspid roots. When we consider that the blood supply is less at these spots, the tissue forming the alveolar septa being more readily broken down, it is easily understood why systemic etiology should cause Riggs' pockets preferably at those places.

But toxic ingesta from local conditions affect the system so as to determine auto-intoxication, the etiology becoming systemic where originally it was not so—so that all advanced cases necessarily assume a systemic type.

CONSIDERATIONS AFFECTING DIAGNOSIS.

Any pathological condition which reduces the vital tone of the system is a cause predisposing to Riggs' disease. Neurasthenic conditions affecting the blood nourishment of the tissues are necessarily among the chief systemic causes. Such a condition is of course frequently coupled with anemia, but all forms of auto-intoxication are equally responsible for the trouble, whether they proceed from the kidney, from the intestine, or from the liver, since any such disturbance necessarily leads to neurasthenia. Yet neurasthenia may exist without any excretory organ being decidedly at fault, nor must we lose sight of the fact that the ingesta infected by Riggs' pockets, whether these result from a systemic or a local cause, are equally toxic to the entire organism. Although we must recognize and fully appreciate the frequency of diabetes as a cause of the ailment, it is certainly a great mistake to adhere to the old-time theory that abnormal kidney function is the most important systemic predisposition to the disease, in the face of the fact that such a vice is comparatively seldom revealed in severe Riggs' cases by the most searching urine analysis. Certainly, we should hunt for the etiology of cases in the directions above mentioned. At this day, advanced medical thought recognizes such a thing as "stomatitis gonorrhoica," a Riggs' disease cause never suspected in the past.

Of course oral examination and a thorough scrutiny of the condition of pockets and of roots can do much to differentiate between systemic and local conditions, but the book remains closed until the general pathological condition of the patient is properly studied. This study represents an extensive, searching, and comprehensive tableau of the patient's condition, and where symptoms point to a necessity for it, in order to clear the diagnosis, analysis of urine and other excretions is necessary. The general pathological condition must be corrected, or else local improvement obtained at the cost of the great tax on both the patient and the operator will not be permanently maintained. Everything must be looked after: medication, diet, hygiene, and hydrotherapy. Whenever necessary the help of a physician who properly studies his cases and is really a diagnostician must be obtained. As a rule, there is more danger of being hampered than helped by the simultaneous treatment of a Riggs' patient by a physician, unless the latter be such as just mentioned, and unless he fully realizes what a Riggs' condition means to the organism of his patient, and what general pathological conditions it must necessarily entail. Unfortunately, the dental profession has not realized the gravity of Riggs' conditions sufficiently to raise its voice loud enough to cause the practitioner of general medicine to appreciate them. The fault and the failing lie primarily at the door of our own profession.

PRINCIPLES OF TREATMENT.

After following the experience of others for a few years, supplementing diet, hygiene, and hydrotherapy by drugs used in Riggs' conditions according to their origin—in which medication the combinations of iodin and maintaining the bowels open form the groundwork, while uric acid eliminants are used as adjuncts whenever kidney functions are suspected—I think that I have worked in a safer, firmer, and more reliable direction by returning to the fundamental line of treatment which, without apply-

ing specially to this ailment, has been already discussed in the articles which appeared in the *Dental Brief* of June and July 1907. Wherever the intestine is at fault, it is normal function which is really needed, not the irritation which usually follows the frequently repeated administration of even mild laxatives; so that with the help of a laxative diet at the start, I have learned to depend on the medication above mentioned to re-establish proper function, while I have grown partial to a thorough washing of the intestine by copious enemas to ward off the danger of toxicity until proper normal function can be re-established. The ideal is a three-quarter-gallon bag of barely tepid water with a heaped teaspoonful of sodium bicarbonate dissolved in it. After a thorough intestinal washing with this antifermentative enema, tone should be supplied by a small cold one in which a pinch of sodium chlorid has been dissolved.

It is probably useless to dwell long on the question of systemic treatment, for the excellent reason that each case is a study and a law unto itself. Neurasthenic and anemic conditions call loudly for a truly reconstructive food tonic, but very frequently faulty assimilation must be overcome before any real benefit can be derived from that treatment. In such cases, a careful watch of the patient's weight is the only safe guide.

ORAL HYGIENE.

Many protracted acute diseases leave Riggs' disease in their wake, some on account of systemic disturbances and infective films in the oral cavity, others by reason of the unhygienic conditions which physicians and trained nurses have allowed to prevail during their treatment of the case, just because they failed to realize that their patient's recovery would be helped by proper oral hygiene avoiding the constant recurrence of toxic ingesta. The excellent results to be obtained from continued mouth cleanliness are notably made manifest when feeding is resumed after typhoid fever, the patient's alimentary canal more readily bearing food which has not been infected at its gateway. The fact is that for both systemic and local reasons oral hygiene is a still greater necessity during any systemic disturbance than during normal health. This is another truth which the dental world does not proclaim often and loudly enough for its medical brethren to enforce and the laity to heed. So much for the systemic aspect.

Locally, there is no limit to the dental ailments which would be averted by proper oral hygiene during illness of any kind. Typhoid, without mouth cleanliness and gum massage, is, among other diseases, an excellent example for deleterious results—*systemically,* increased auto-intoxication from infected ingesta, greater alimentary disturbance, circulatory stagnation, Riggs' disease; *locally,* fermenting plaques, irritating calculi, caries, local gingivitis, Riggs' disease. Thus Riggs' disease has a double causation, but unfortunately such sequelæ in the presence of oral neglect is not limited to typhoid, and may develop in all long sieges of systemic disturbances; and after gestation, there having normally been a disturbance only, without a disease, we frequently meet with the same awful local results, caries and Riggs' disease, unless oral hygiene suitable to the condition has been maintained.

The wolf is the ancestor of the pug dog. The wolf's gums are constantly massaged by the fur and the skin of its prey, and this animal takes active open-air exercise, frequently running miles for its drink. The pug is the house dog *par excellence.* Pastry and sweets from the table and its mistress' hand constitute its principal diet, while a pan of water is near by to quench its thirst. The creamy residues around the conical teeth ferment, while the gums have received no attrition, their local circulation not even being sustained by the systemic arterial pressure which would have been caused by proper exercise. The pug dog suffers from caries and Riggs' disease; so do we. Were general hygiene and gum massage by the friction of brush bristles from the roots to the crowns frequently

and faithfully observed from childhood on, it seems doubtful that mature life could develop Riggs' disease, even in spite of disease, unless oral hygiene had been completely suspended during a long spell of illness.

THE PATIENT'S PART.

Locally, the home treatment administered by the patient is so nearly as important as that administered by the operator at the chair that it is almost useless to start the latter unless the patient has thoroughly realized the importance of the former. The patient must maintain a cleanliness as near as possible to an absolute one both on tooth-crowns and tooth-necks, and in addition to this, must frequently repeat the stimulation to circulation in the gums. A suitable mouth-wash must follow each mouth toilet; occasionally a proprietary mouth-wash the ingredients of which supply the detergent stimulating or astringent properties needed, but oftener a mouth-wash specially prescribed should be used which supplies greater alterative, astringent and antiseptic factors than the proprietary ones compounded with a view to sacrificing much stronger medicinal effect to a fear of being distasteful to the user. It is of course useless for me to dwell on the manner in which the patient may keep the teeth and their necks as near to absolute cleanliness as possible; we all know this.

PHASES OF LOCAL TREATMENT.

Local treatment will cover many phases, fortunately sometimes fewer, according to the conditions of each case: (1) Preliminary scaling of necks and roots. (2) Opening the pockets by bismuth-paste packing. (3) Extraction of roots which have lost too much of their attachment to make their preservation a mechanical possibility, or which would jeopard a final result. (4) Disoccluding such morsal surfaces as malocclusion causes to strain on affected roots; removal of irritating ferrules and protruding edges of cervical fillings. (5) Local and systemic home treatments. (6) Tartar solvent and bismuth-paste treatments. (7) Decalcification of badly affected roots. (8) Thorough scaling of the roots and curetting the alveoli. (9) Solvent treatment repeated. (10) Band-aging. (11) Amputation of roots. (12) Prophylactic treatment. (13) Restoration of the arch. (14) Final local and systemic instructions.

The above program applies to advanced cases, of course. The few words by which the above phases are covered tend to make them look short and easy; this impression may as well be corrected from the start by saying that when phase 8 is reached, viz, that of thoroughly scaling the roots and curetting the alveoli, the operator should not expect to treat more than one tooth at a sitting, if it be a molar, and little more if some other teeth are on the program for that sitting.

(1) Preliminary scaling of necks and roots; (2) Opening pockets by bismuth-paste packing; (3) Extraction of roots which have lost too much of their attachment to make their preservation a mechanical possibility, or which would jeopard a final result. The degree of looseness of a tooth is not sufficient to indicate the advisability of its removal. Teeth which appear to be hopelessly loose will, under proper treatment, regain a surprising degree of firmness, provided their retention has not become a mechanical impossibility. If the disease has advanced so far that only one-third of the length of a root may be hoped to be held by healthy tissue following operating upon it and its alveolus, an absolute mechanical impossibility of retaining that particular root exists, and the wiser course is to decide on its extraction without unnecessary delay, in order to concentrate efforts in other localities. But in some exceptional cases where roots are few and precious and where one may be braced by another stronger one in the final construction of a bridge, an effort should be made to preserve roots wherever a small chance of success exists, in order to avoid the loss of masticative power which would accrue to the patient

who must eventually wear plates of any description instead of a rigid artificial substitute for the natural teeth lost. As has just been said, the degree of looseness of a root cannot intelligently determine its extraction, and very frequently, in fact habitually, a careful preliminary scaling—not yet a thorough one—must be applied before the chances of success in any special locality can be properly estimated by a painstaking exploration of the pockets. A detailed chart of the mouth, on which a plan of treatment can be laid out, is an invaluable aid.

While this part of the work proceeds, pockets may be packed with bismuth paste, to open them slightly and make them more accessible, this paste at the same time exerting a most excellent influence on the suppuration within them. As a palliative, if there is much pain in some pockets, packing with guaiacol paste after a very thorough irrigation will afford temporary relief. Hot irrigations with slender nozzles, such as those of Berlin syringes or those used for Dr. Joseph Head's "tartar solvent" will be necessary to dislodge the paste from molar-root bifurcations at a subsequent sitting. But guaiacol paste cannot be expected to be effective unless it be sufficiently rigid to be retained in sockets. The following paste is the result of personal experiment: Guaiacol, 20 per cent.; vaselin, 10 per cent.; paraffin, 70 per cent.

Pastes of any kind are best packed in sockets by the use of an all-metal syringe of convenient size, which may be warmed, carrying a small flexible point which is bent to suit conditions.

Again, as ultimate success will depend upon the amount of blood supply and proper nutrition that each individual root may obtain in the future, it is wise to sacrifice such roots as might cause a congested condition in their neighborhood, either owing to their individual condition or to their being crowded on neighbors so as to leave an insufficient amount of alveolar process between them.

(4) Disoccluding such morsal surfaces as malocclusion causes to strain on affected roots; removal of irritating ferrules and protruding edges of cervical fillings. Plaster casts are very frequently necessary to determine the points of strain, very frequently, again, such conditions may be ascertained by a careful examination of the mouth, and often only a small amount of grinding on the morsal surface or edge of some teeth will suffice to relieve undue strain. But where doubt exists, study by casts is the only safe course to pursue. When conditions either of malocclusion or of the disease show that any roots must be given complete rest, there should be no hesitation about the complete removal of natural crowns from such roots. It must be borne in mind that future building is possible as long as a safe foundation may be preserved, and that the loss of such a safe foundation necessarily condemns the patient to the wearing of dentures by which he must lose five-sixths of the masticative power that bridges would in time supply. Where operating conditions are unfavorable, they will be facilitated by the removal of crowns from roots, or portions thereof, frequently at the very teeth where the most thorough root-scaling and socket operating is of greater necessity. This increased access to the roots themselves often helps in a correct diagnosis leading to the amputation of a root from a multi-rooted tooth.

When the ill-fitting ferrule of an artificial crown on the cervical edge of a filling irritates the soft tissues, either by imprisoning fermentative material or by impinging on the gingiva, the removal of the irritant becomes an absolute, uncompromising necessity. Soft tissues can no more recover in spite of such constant irritation than they could in spite of the presence of calculi of any kind, and, in the case of defective ferrules, conditions are often still further aggravated by the fermentative recesses mentioned.

(5) Local and systemic home treatments. The home treatment of the patient is of paramount importance, both locally and systemically. Of course, purely local cases dispense with systemic treatment any further than the observ-

ance of proper rules of hygiene, which by inviting a favorable reactive power in the general system, help the rebuilding of tissue which has been lacerated. Healthy cicatricial tissue is frequently all that may be obtained to replace the old pathological cells which have been destroyed. Half a loaf is far better than no loaf at all when one is hungry, and that patient is close on to starvation whose food cannot be properly prepared for assimilation, and is in addition charged with toxic material in the oral cavity before deglutition—whence the frequent development of neurasthenia with local Riggs' disease as a cause.

There is really no reason, as stated by an essayist on this subject, for the avoidance of an astringent mouth-wash before all affected roots have been thoroughly scaled. Soft tissue never closes over a particle of serumal calculus, no matter how small, and toxic fluids will continue oozing from such a spot, the possibility of a pocket healing over it being still less. On the contrary, the persistence of the discharge from a pocket for over two weeks after a root and socket operation—which one thought absolutely thorough—will usually, in local cases especially, indicate that this very spot must be returned to for the removal therefrom of either some minute chunky or frosty deposits from the root or some carious alveolar tissue, and replantation may be resorted to when less heroic means fail to assure the preservation of some really needed root on which treatment out of the mouth will allow unerring accuracy. Of course, either the root must not project from the gum or rigid bandaging must be provided.

It is best, from the very start, to put the patient under a mouth-wash which combines the properties of a strong astringent, an alterative, a germicide, and a pus solvent. The combination in the same mouth-wash of tannic acid, iodin, potassium iodid, and formalin provides these desiderata. The most astringent factor, tannic acid, exerts at the same time a remarkable action on the pus. Glycerin and water are necessary as vehicles. I am indebted for the following formula to Dr. H. T. Stewart of Memphis, Tenn., and I have noted most excellent results from it:

℞—Tinct. iodin,
Potass. iodid,
Tannic acid, āā ℥ij
Formalin, gtt. xx
Glycerin, ℥ij
Aqua dest., q. s. ad ℥viij. M.
Sig.—Mouth-wash, four times daily, 1 part to 5 parts of water.

The use of this mouth-wash should be the crowning performance of the mouth toilet, massaging all the gums with a soft and small tooth-brush charged with it, and finishing by vigorously rinsing the mouth with the remainder of the contents of a small tumbler. The iodin stains the teeth, not markedly on their enamel, but just beyond it on the root-necks. This is of very minor importance. To start with, this staining can be used as an incentive for the patient to more vigorously brush with a dry powder; again, prophylactic treatment must follow socket operations, and this treatment carries with it the proper polishing of root-necks and enamel, so that the staining is a matter of temporary duration, and pales into insignificance in comparison with the benefits to be derived from the mouth-wash. The alterative iodin exerts a remarkable action on soft tissues affected with Riggs' disease. Increased friction applied to fight the iodin stains stimulates the hard tissues of the teeth, besides the soft ones of the mouth, procuring additional help in that way.

There was a time when I feared the use of a powder insoluble in saliva in the presence of Riggs' pockets. I have completely lost that fear; it has been cured by observation. Any pocket which is discharging will rapidly be freed from any particles of a powder, so that it could not act as a local irritant there. Any pocket which has been operated upon successfully and is on the road to recovery will easily take care of any such insoluble particles, ejecting them as the healing tissue grows fast to a tooth-root.

More stimulation can be obtained from a powder which in use preserves slight abrasive properties than from one which loses those properties on account of its solubility in saliva. A powder which in addition furnishes oxidizing properties is a greater desideratum. We need not discuss the manner in which the tooth-brush should be employed, as from infancy to the grave that never varies. A tooth-brush must be used which facilitates proper access to all surfaces of all teeth and in gaps, even the most inaccessible. Except where tumefied conditions or post-operative soreness exist, a brush as hard as can be borne should be used on the teeth. The program should be: (*a*) A ribbon silk rubbed on all approximal surfaces of all root-necks; (*b*) brushing the teeth with dry powder; (*c*) vigorous rinsing with water, and (*d*) gum massage with a soft brush charged with a suitable mouth-wash, finally vigorously rinsing with this mouth-wash.

This should be repeated after each meal and at bedtime, with the exception of the powder, the employment of which may be limited to morning and night use. In addition, tongue scraping on rising in the morning, followed by the use of the mouth-wash, is usually necessary. Scummy deposits on the dorsal portion of the tongue, maintaining an irritating fermentative process in the mouth, necessarily hinder the recovery of affected soft tissue, to say nothing of the ingesta thus affected. Ribbon-silk friction not only acts as a mechanical cleanser on the necks of the roots, but stimulates the circulation in the marginal gum tissue—that is, friction, not merely by passing the silk between the teeth, but friction at their necks. Dental creams and pastes never give enough attrition to stimulate, and seldom even cleanse. Dry powder friction is the necessity.

Patients need not be condemned to the use of a mouth-wash as unpleasant as iodin for the remainder of their natural lives. Later on, when the case will only require occasional prophylactic treatment, the operator may select some pleasant proprietary mouth-wash for frequent use, providing it possesses either the stimulating properties of zinc chlorid or the detergent and antiseptic action of hydrogen dioxid, boric acid, thymol, etc. But, as long as vigorous astringency and an alterative action are needed, I am afraid that a pleasant mouth-wash is not a possibility.

(6) Tartar solvent and bismuth-paste treatments. Conditions of pockets determine whether the use of Dr. Joseph Head's tartar solvent or their packing with bismuth paste should preferably precede thorough root-scaling. If access to the inside of pockets is difficult, a few packings with bismuth paste, repeated as often as every twenty-four hours, will after a few days distend the soft tissue. Bismuth paste acts very favorably on suppuration, but, unfortunately, nothing short of instrumentation can remove the cause thereof. Bismuth subcarbonate acts as nicely as the subnitrate, with the advantage of being nontoxic in any quantity.

Dr. Joseph Head's tartar solvent is a valuable adjunct. It will not dissolve serumal calculi and free the roots therefrom, but its action on those deposits facilitates their scaling off by rendering them less adhesive to the root's cementum. An extensive use of it makes it appear reliable for dissolving small particles of root deposits, and that is why I very frequently employ it immediately after scaling roots, since there is always a likelihood of some tiniest speck on a root having escaped the scaling. The tartar solvent must not be employed at close intervals, or else too great an irritation will result, while on the other hand, if used cautiously, it develops an excellent stimulating effect on the soft tissue. After trying all the methods for its application I have heard of, I have returned to one which I was employing long before beginning the use of that drug. Wrap cotton loosely on a platinum broach, of a size to suit a pocket, making sure that the seton will easily leave the broach, and that the metal point will not perforate the cotton; saturate with the solvent. Keep the parts dry during and for a few minutes after

the application. If the pocket be small in diameter, wrap the cotton very thin, and plenty of surface can be covered anyhow by using in the same spot several broaches so wrapped, if the gum tissue be close to the root there. In approximal pockets between bicuspids and molars, setons of cotton charged with solvent can be introduced from both buccal and lingual aspects, by having several broaches prepared as above. After a few minutes the setons are removed. Allow a few more minutes for the action of the solvent to be exhausted, and pack the pockets with bismuth paste.

(7) Decalcification of badly affected roots. Clinical experience shows that the removal of pulps tends to strengthen peridental membranes, provided that the root-canals have been properly cleansed and filled. In addition, clinical experience also shows that intra-decalcification of roots, by creating a demand for calcium salts, further prompts the adhesion of membranes to the cementum of roots. Therefore, wherever conditions are such as to render doubtful a permanent preservation of the roots, the wisest course to follow is to remove the pulps. Anything not tending to lower the vitality should be given the preference over arsenical applications. Moreover, the danger of arsenical infiltration, however slight, is ever present, and for this important reason the use of that drug should be avoided. Pressure anesthesia serves us in good stead. Sulfuric acid, 50 per cent. strength, is my mainstay for purposes of intra-decalcification. I have found it to work satisfactorily, and have therefore not experimented with other drugs, as for instance, phenol-sulfonic acid. But I am not prepared to say that other drugs may not answer the purpose as well as sulfuric acid; there are different ways of killing a bird. Of course, conditions which may have indicated a complete removal of crowns from roots will usually also require the intra-decalcification of those roots, and it would have been much more convenient to have that decalcification done before the removal of the crowns. Whatever internal treatment is necessary to roots had better be practiced before their thorough scaling and operating upon their sockets—so as to complete internal treatment and root-filling before the soreness sets in which will always result from severe socket work.

(8) Thorough scaling of the roots and curetting the alveoli. The crucial part of the local treatment is the scaling of serumal calculi off roots, and the removal of any carious alveolar process. No matter how thoroughly and perfectly the rest of the treatment be done, and no matter how well the systemic nature of the case and its treatment be understood, failure must come in the wake of any imperfection in removing calculi (whether of a chunky or frosty nature) and of allowing to escape any adjacent diseased tissue. Unfortunately, the stable must sometimes be burned to roast the pig, even at the expense of the resorption of alveolar tissue which may follow, for it is much better to risk the latter than the persistence of pus-secreting pockets, which persistence involves the loss of the root or the health of the patient. It is far preferable to have a smaller proportion of a root ultimately well incased in bony tissue than to have more of it still wabbling in an unhealthy socket. Relief, however, comes from the fact that in cases where the alveolar tissue is not severely involved—and these conditions must be determined by the operator, so that he may direct his treatment intelligently—the use of small and slender instruments will insure the root-scaling without much damage to the adjacent tissue. No localities tax skill and patience as greatly as the bifurcation between molar roots, also upper first bicuspids, though in a lesser degree. The greatest difficulty is encountered at the upper molars, at the pointed angles formed by the convergence of three roots, and at adjacent spots. Frequently, if an insufficient approximal space prevents proper access from mesial and distal directions, it will be necessary to wedge such teeth apart in order to obtain such access. It is unsafe to rely upon having properly reached the spots just mentioned by access from the buccal side only.

Variations developed from instruments Nos. 1 and 2 of the Good-Younger revised set of fifteen instruments, modifications of these instruments obtained by curving the extremity of their scraping points very slightly, and in addition twisting those curved scraping points in every practical way, seem to offer the best possibility for thorough work in the places just mentioned. Instruments suitable for doing such work cannot, according to correct principles underlying the manufacture of instruments, carry their working points in the axis of the shank, but this defect is overcome in a great measure by providing the handles of such instruments with small knobs, which bring the force and the rest of the operator's fingers more nearly in the plane of the working points. To Dr. Younger of California is due the credit for the suggestion of such knobs on instrument handles. Bifurcations between lower molar roots, offering a slightly smaller difficulty, are also provided for by the above. If any anesthetic is to be used in this part of the work, the most reliable one is the hypodermic injection of a cocain solution of small percentage. As a rule, however, wherever there is no necessity of operating on the alveoli themselves, instrumentation with small slender points can be carried on with so little pain as to allow dispensing with any anesthetic. Tissue nourishment is seriously disturbed by injections, retarding recovery. Injections should therefore be avoided as much as possible.

The root and socket surfaces of teeth immediately adjacent to any tooth that is attended to at a sitting should also be thoroughly finished at the same sitting. This does not hold good if gaps exist next to the tooth under operation. But, if approximating teeth are present, their adjacent root and socket surfaces had better be scaled and curetted then, so that any treatment following instrumentation may apply to them also, and no early operative return need be made in approximal regions already made sore. I am partial to pull-cut instruments for accomplishing just exactly what is wanted on roots. On a smaller scale, the motion of such instruments should be more like that of a vulcanite scraper on a plate, and still more similar to that of a pencil eraser on paper, the push stroke being much lighter, and not like that of a plane on wood. Instrument points should be so directed as to operate on only a small speck of a root surface at a time, making sure of having completely scaled that point before passing to an adjacent spot either horizontally or vertically. Such operating should be done not only where well-defined pockets exist, but also wherever soft tissues fail to closely hug and adhere to cementum. If the alveolar tissue be affected beyond, diseased portions surely lead to it, if they are properly followed. On the other hand, soft tissue should be respected wherever it is attached to the pericementum, but instruments should reach quite to the lines of such attachments in every direction. In many cases where a denuded diseased alveolus is felt, it seems preferable to actually bur it off, making sure to remove it very completely, preferably sinning in the direction of cutting into sound tissue rather than permitting some diseased alveolus to escape.

There are two ways of handling a jaw which is affected generally by the disease. One is to begin at the most posterior tooth on one side and stop at the median line; then continue by starting at the most posterior tooth on the opposite side and again come to the median line. This has the advantage of allowing time for molars on one side of the mouth to lose much of their tenderness before the molars on the opposite sides are made too sore for mastication. The second way will grow out of aggravated conditions in some localities, in which instances the operator will see that such places must be operated upon at the start, so that ample time may elapse to watch their behavior while the surgical treatment is being continued elsewhere. If operations have been severe, wounds should be frequently irrigated, just as is practiced in general surgery, until such a time as the tissue shows a proper tendency to heal. Bismuth paste following such irrigation acts very favorably, at

the same time warding off the danger of impaction of fermentative material.

(9) Solvent treatment repeated. However thorough the scaling of a single or multi-rooted tooth may have been, there is safety in making use immediately after operating, of a drug capable of dissolving calcareous particles. Wherever the alveolus has been seriously affected, greater reliance may probably be placed on 50 per cent. sulfuric acid in glycerin, because long clinical experience indicates its marked action on hard tissues, with a reduced irritation to soft ones. "Reduced" in this connection unfortunately does not mean that such irritation is slight, but hyperemia of any parts, as Dr. Augustus Bier of Berlin has very thoroughly demonstrated, is a means to recovery. On the other hand, when no special action on alveolar tissue is sought, Dr. Joseph Head's tartar solvent seems entirely satisfactory, avoiding the irritating and escharotic action of sulfuric acid when used in a strong enough proportion to be efficient. Some operators prefer phenol-sulfonic acid, some lactic acid, etc. The fact is, that any operator doing his root-scaling and alveolar curetting thoroughly will prefer a special acid, and some men even use no acid at all, for the very excellent reason that perfect instrumentation is the fundamental key to success. The seton carrying the drug should be made of a size proper to suit the pocket; sometimes two or more setons are indicated in the same pocket. The action of the acid will be nearly exhausted in the course of about ten minutes after its application; on the other hand, if more convenient, it may be allowed to remain for a few hours or until the next day. For that matter, such applications would work out by themselves in a very few days. But the patient's discomfort will be lessened by removing the setons in a few minutes, or in the course of a few hours when the greatest possible chemical action is desired, such removal to be followed by packing with bismuth paste.

(10) Bandaging. There is a drawback to any bandaging which may be done in Riggs' cases. No matter how a bandage be constructed, it tends to hinder the patient's performance of proper cleansing at the necks of roots. This can of course be supplemented by the operator seeing the patient often enough to correct that defect in a measure, but it is impracticable for the patient to be in the chair three or four times within twenty-four hours, which is the frequency with which the patient should apply home treatment. Teeth should therefore not be kept bandaged any longer than absolutely necessary when temporary bandaging must be resorted to after operating upon the roots and sockets, and may be dispensed with as soon as the roots begin to show some resistance after having wabbled in their sockets. Round wire, No. 26 gage, is as good a material for temporary bandaging as may be desired. Difficulty may sometimes arise from the tendency of a wire slipping into the gum as it is tightened around the necks of roots, but usually this difficulty can be overcome by careful manipulation. When lasting bracing is later required, when a case is on the road to recovery, nothing seems so favorable as the construction of inlays joined together with posts extending into the roots, constructed so that easy cleansing with toothpicks may be practiced at the necks of the roots, in lieu of the more desirable silk friction, which is then impossible. Teeth which will require permanent bracing like the preceding are necessarily such as were so badly affected as to indicate root intra-decalcification in the early stages of their treatment, so that any additional devitalization needed for their support by bracing may not extend farther than the adjoining teeth. Cleansing by toothpicks is much inferior to silk friction as a mechanical cleanser, and still more so as a stimulant to gum and cervical tissue. Joined bracing inlays should therefore be cut and separated just as soon as the conditions allow it. At best, the preceding plan seldom amounts to any more than a temporary compromise; such teeth as must be kept braced in order to be retained are usually a menace to their neighbors, and the wiser plan would be to sacrifice them to

assure the preservation of adjoining strong supports for bridge work. It is only in cases where removable bridge work, such as devised by Dr. H. T. Stewart of Greenville, is contemplated, that roots requiring permanent bracing may be made use of in helping to carry such removable bridge work, which in turn braces them while allowing proper prophylaxis.

(11) Amputation of roots. If two roots of a molar may be restored to health while the other cannot, and if those roots which are amenable to treatment may be useful in supporting bridge work, it will become advisable to amputate the hopeless root in order to preserve the others. Of course, root-filling must always precede amputation. Such roots must necessarily, in the beginning of the treatment, have been in a condition requiring their intra-decalcification, so that they have already been filled following their internal treatment. In some exceptional cases, governed by the condition of their environment, it may be advisable to allow the crown of an upper molar to remain in its entirety in spite of the removal of one of its buccal roots, but this is a very exceptional occurrence. Sometimes, again, an early decision on the amputation of a molar root will facilitate the scaling of the others, it being ascertained at the outset of the treatment that a root is hopeless and must be removed to increase the chances of preserving the others. While an upper molar crown may sometimes be retained in spite of the deprivation of one of its buccal roots, half of a lower molar crown must always be removed at the same time as its supporting root, to avoid the leverage which would otherwise be exerted on the root which is to be preserved.

(12) Prophylactic treatment. As soon as the surgical treatment of a case has been completed, prophylactic treatment must be started. Thorough work in that direction will hardly allow of handling more than one jaw at a sitting, either upper or lower, unless many teeth have been lost. At all openings which have not yet completely healed, roots, as well as the necks of all roots, must be scaled with slender instruments, making sure that not the minutest speck may escape, still greater attention being paid to the approximal surfaces of root-necks than to the others. Newly formed tissue should, however, not be torn away. The application of very stout, waxed flat floss silk charged with a paste made of finely pulverized pumice and hydrogen dioxid should follow, thoroughly polishing the approximal surfaces of all root-necks; then use a small rotary brush in the engine to polish the labial, buccal, and lingual surfaces with the same paste. Not only will the hard tissue be cleansed in this way, but blood circulation in the soft tissues will be stimulated, preparing them to receive more benefit by the application of some drug indicated. While keeping the parts free from saliva, 10 per cent. zinc chlorid may be employed if a stimulant astringent effect is desired, pure iodin tincture (Churchill's) if an alterative and antiseptic action is sought, while sluggish cases which require severe stimulation backed by strong asepsis may be treated with pure formalin. In the beginning of this phase of the treatment, the handling of one jaw every three or four days is sufficient. Later on, the intervals between sittings may be increased, provided that the case behaves satisfactorily while the attention to it has been lessened. Until complete recovery the patient should be seen once or twice per month, the prophylactic treatment to be kept up as indicated above. Sensitive root-necks resulting from alveolar resorption will be relieved and finally made comfortable by occasional applications of sodium carbonate or silver nitrate, saturated solutions—the former being given the preference only where stains may be conspicuous.

(13) Restoration of the arch. Unfortunately, Riggs' cases seldom present themselves in time, or are correctly diagnosed in their incipiency. Treatment, if properly followed by the operator and the patient before a case has become so advanced as to involve the alveoli, may be pursued without entailing the sacrifice of any root;

but treatment started in an advanced condition of the disease will confront us with the necessity of restoring the dental arches at the finish, both that the patient may be supplied with sufficient masticative power, and that the teeth which may have been preserved, adjoining gaps, may be sufficiently supported in the performance of their functions. No form of plate work is an ideal substitute for lost organs in such cases, because it fails to brace the adjoining natural teeth sufficiently, and because more or less strain is always exerted on them. The problem of suitable restoration has been solved by Dr. H. T. Stewart's removable bridge work. It allows of proper cleansing at the necks of abutments and the replacement of molars where no natural ones have been preserved as piers, while roots are braced with perfect rigidity. On the other hand, fixed bridge work becomes safe wherever the condition of the lips and the length of the crowns allow of its being constructed so that the brush may play freely under it, insuring a thoroughly cleansing all around the necks of abutments by the patient, who must be trained to do so, and to maintain vigilance in that direction. Safety exists in such cases only at the price of eternal vigilance. Fortunately, after the resorption following surgical treatment has taken place, sufficient space may be allowed under bridges for purposes of cleanliness, especially in the neighborhood of bicuspids and molars; but occasionally, and more particularly on the mesial faces of molar abutments, even the end-tuft of a small tooth-brush must be supplemented by a hard bristle point one similar to but smaller than a mucilage brush. More than ever, beware of defective ferrules, which may become sources of irritation by not being properly fitted, or by impinging upon the soft tissues; even a healthy mouth will seldom withstand the effect of such ferrules, they frequently becoming the cause of local Riggs' conditions.

(14) Final local and systemic directions. By the time this stage is reached, that of dismissing a patient for a few months, he should have become so thoroughly imbued with the absolute necessity of maintaining perfect cleanliness around the necks of the teeth by the means already discussed that all the operator need do is to insist that the habits acquired be persevered in, as expressed by a patient, "even if heaven and earth come together." A pleasant mouth-wash suitable for the case may by this time be substituted for a more truly medicinal one, but without neglecting the oral prophylaxis and the gingival stimulation. Systemic directions should continue on the lines of treatment which have been found beneficial to the case, reducing medication of course, and further instructing the patient to report promptly if anything develops which has not been experienced in the past. This is, however, not likely to occur, as recovery should be so marked by this time, both systemically and locally, that more danger exists from the negligence usually prompted by a feeling of comfort and safety.

A WORD ON THE NOMENCLATURE.

Riggs' disease has been discussed in this paper under that name only. "Riggs" certainly has the defect of giving no pathological picture of the condition, but it avoids the greater defect of depicting only one phase of it while ignoring the great multiplicity of symptoms, their etiology and pathology. There would be no disease without the separation of mucous tissue layers surrounding a root, and without the layer of tissue immediately adjacent to the cementum ceasing to embed its fibers in it, forming serumal pockets instead; but faulty circulation resulting from local irritation or systemic vice is back of even these initial pathological conditions. A name designed to depict only initial etiologic conditions would already be a long one, but one intended to cover the numerous phases of Riggs' ailment would fall short, unless it were nearly as long as this entire article, hence its being on "Riggs' disease," and yet very incomplete in spite of its length.

THE PROPER USE OF A NORMAL AND HYGIENIC BUCCAL CAVITY, AND ITS EFFECT ON THE HEALTH AND NUTRITION OF THE BODY.

By R. E. LUTHER, D.D.S., Batavia, N. Y.

(Read before the union meeting of the Seventh and Eighth District Dental Societies of the State of New York at Buffalo, October 29, 1909.)

THE subject that I have chosen is so broad that even to treat it in a general way would require more time than is allowed me tonight. If anything I may say aids to the slightest extent in conserving or improving the world's greatest asset—health—then I shall surely feel amply repaid for my effort. There is very little in this paper that is original, it being made up of quotations from the pens and thoughts of men of unquestioned eminence in their departments.

Ingersoll, in writing of Lincoln, said: "He knew that great men and great women are the best things that a nation can produce—the finest crop a country can possibly raise."

We live in a wonderful age. Navigation of the air is no longer a dream. All parts of the globe have been visited by man, the great physical forces are being utilized, the natural laws are being used to promote national prosperity. Would it not be wise, in this age, when every effort is being made to conserve all natural resources and everything is figured on "cost of production," to pause and look to the health and efficiency of the human race and see if *it* has not an economic value?

Are we figuring as carefully the cost of production and using the same intelligence and thought in conserving *our own* natural resources? There is evidence all around that we are not, unless we maintain that human degeneration is inevitable. If the latter be the case, is it necessary that human degeneration be so much more advanced than that in lower animals? These questions, as we are happy to know, are occupying the minds of some of our greatest scientists. It is from these great minds, these unselfish heroes of the world of science, that I shall draw.

Dr. Thomas Oliver, in his preface to Bouchard's "Lectures on Auto-intoxication in Disease,"* says: "Man is constantly standing, as it were, on the brink of a precipice; he is continually on the threshold of disease. Every moment of his life he runs the risk of being overpowered by poisons generated within his system. Self-poisoning is only prevented by the activity of such excretory organs as the kidneys and by the watchfulness of the liver, which acts the part of a sentinel to the materials brought to it by the portal vein from the alimentary canal. Disease is not something altogether apart from the individual." This statement, considering the speaker's authority, is appalling, and I ask you, as men of science and men of common sense, Should this condition of affairs exist? Is it not contrary to the condition that exists in all other animal and plant life? Is it not a fact that disease is ordinarily the exception rather than the rule? Personally, I cannot sympathize with the statement that self-poisoning is only prevented by the activity of the excretory organs and the watchfulness of the liver. That such conditions do

* "Lectures on Auto-intoxication in Disease," preface, page ix. F. O. Davis Co.

exist in the bodies of too many people of today I do not doubt, but I cannot believe that nature ever intended disease to be a part of us. I cannot believe that man, the most nearly perfect of all life, has normally generated within his system poisons that "lie in wait," so to speak, to get in their deadly work the moment there is a lull in the vigilance of the organs of excretion.

Admitting that man is not normally filled with toxins that act automatically as soon as an organ ceases to functionate, why is he so much more susceptible to disease than any other animal? As we look over the animal kingdom, we notice that the more an animal is humanized, the less perfect and less hardy it is physically; hence man's susceptibility to disease is undoubtedly due to his being farther separated from the natural. Obviously, man has many ways of living and many habits that are unnatural. Appreciating fully the importance of fresh air, exercise, etc., to bodily equilibrium, I wish to invite your attention to a set of organs which have suffered from this process of degeneration probably more than any other part of the body. I refer to the mouth and to the organs of mastication, about which too little has been said respecting the part they play in the nourishment of the body. Just why the mouth and teeth have been considered of local importance only is hard to see, but I fear that the profession which is entrusted with the care of these organs is not exempt from criticism for failing to establish earlier the value of the organs of mastication to the whole body.

We know that the mouth is the orifice through which all food is taken into the body, the entrance to the alimentary canal. It has aptly been termed the "gateway to the body." Food being an essential to life, it would seem that the health of the organ through which all food must pass is of paramount importance. We of the dental profession know that this gateway to the body, this organ which receives all the dainty and tempting viands, this organ which contains the teeth to masticate and the taste-buds to taste the food, thereby stimulating digestion, is in a disgracefully large percentage of people a veritable cesspool, teeming with bacteria and filth, with the teeth so sore that they can functionate only with a degree of pain that is prohibitory to perfect digestion.

Let us consider the mouth a little more carefully. In it we find teeth, tongue, saliva, nerve-endings, etc., and also mastication, digestion, feeling, taste, perhaps smell, all of which have more or less effect on the preparation of food for subsequent digestion, and all of which are wholly or partially under control of the will.

Whenever an organ or a set of organs in the human mechanism is under the control of the will, a degree of personal responsibility is implied, and as in the whole process of digestion only the initial organ is thus controlled, is it not worthy of grave consideration? The mouth truly is the gateway to the body, through which all the food for fuel and repair must pass, and as we shoulder our responsibility and use our intelligence and will, so are our bodies efficient or deficient.

MECHANICAL IMPORTANCE OF MASTICATION.

Before taking up the physiological value of mastication, I wish to remind you of its mechanical importance from an anatomical standpoint.

It might be well to first mention the strength of the muscles of mastication. Dr. G. V. Black reports* that in one thousand persons tested on the gnathodynamometer, the average force exerted by the molars was 171 pounds, and considerably less in the incisors, the variation being from 25 to 275 pounds. 275 is the full register of the instrument used and there were seventeen persons who made the full register; a number of these could have registered a greater number of pounds. Dr. Black says: The force of the bite of an individual is modified very materially (1) by the use habitu-

* Black's "Operative Dentistry."

ally made of the teeth, (2) by the loss of the pulp, and (3) by disease of the peridental membrane. Nearly everyone who makes a trial of his bite on the gnatho-dynamometer stops because of the pain in the peridental membrane, rather than from having reached the full limit of muscular effort. . . . Full and free use of the teeth in mastication, and especially the disposition to use them freely on hard foods, contributes to strength. Any considerable limitation of the use of the teeth, for even a few days, shows in tenderness of the peridental membrane, and in cases where the person has fallen into the habit of swallowing food practically without mastication, the power of the bite will be found as low as 50 pounds, or even lower."

Dr. Black says that only in a few cases that had come to his attention was the full muscular capability registered, the most notable exception being a young man who for some years had made a business of crushing glass, etc., for a living. He could register 215 pounds, and he stoutly claimed that he used his entire muscular effort without any pain.

Artificial teeth in the form of plates can exert only from 35 to 50 pounds' pressure. The importance, therefore, of keeping the natural teeth in position is obvious.

ANATOMY AND NUTRITION OF THE BONES AND MUSCLES OF MASTICATION.

I wish now to recall to your minds the anatomy of the jaws, face, nasopharynx, and tongue, with particular reference to the muscles. Note their massiveness; nearly every muscle of the face, external and internal, is active during the act of mastication, and the tongue and lips are in motion as well as the muscles moving the mandible.

We know that the use of an organ determines the strength not only of that organ, but of all structures contiguous to it. Later I shall hope to prove that the lack of use of the muscles of mastication is an important etiological factor in adenoids and tonsillitis, as well as in many dental imperfections and diseases.

The primary object of mastication is to break up food so that it may be more easily swallowed, and more important still, so that the digestive juices may become more thoroughly mixed, not alone in the mouth, but throughout the whole alimentary tract. The act of mastication promotes the flow of saliva by (1) taste exciting the flow, and (2) probably by the condyle of the mandible moving against the parotid gland, and the tongue and muscles against the submaxillary and sublingual glands, thereby massaging them and causing a secretion of saliva. If mastication is properly performed, the food becomes sufficiently insalivated. In this insalivation of food lies the chemical value of mastication. It is quite generally agreed that the saliva has no action on fats. Authorities differ as to proteids, some claiming that the admixture of the saliva aids in their subsequent digestion. In starches, however, mastication plays an important part; practically all starch can be changed to maltose in the mouth, if insalivation is complete. The following question arises in this connection: Would it not be better to allow and insist on patients making their own maltose, instead of depriving them of starch and feeding them the manufactured article? Apart from the chemical phase of mastication, its use mechanically is of the greatest value to subsequent digestion. The indigestibility of new bread, cabbage, etc., is undoubtedly due largely to their being allowed to go to the stomach in an uncomminuted condition, in which shape they cannot be permeated by the digestive juices. In the animal foods the chemical value of the process of mastication is probably slight, but it is of the greatest importance that they be finely divided. While meat, eggs, etc., are readily digested by the gastric juice, a *lump* of either will resist its action for a long time.

Returning to the influence of mastication on the jaws and adjacent structures, I wish to quote from a series of articles by Dr. Harry Campbell, physi-

cian to the Northwest London Hospital, published in the London *Lancet*,* as follows:

THE INFLUENCE OF MASTICATION ON THE JAWS AND ADJACENT STRUCTURES.

This subject is of such importance that it needs to be dealt with in some detail. By adjacent structures I mean the masticatory muscles, tongue, teeth, salivary glands, the nasal passages and sinuses pertaining thereto, the naso-pharynx, soft palate, and tonsils.

The muscles of mastication. Let me at the outset draw attention to certain anatomical points in connection with the muscles of mastication. These are (*a*) their massiveness; (*b*) the very close relation of the pterygoids to the naso-pharynx, and (*c*) the outward direction of the pterygoids.

(*a*) It is not until one studies the muscles of mastication closely that he comes to realize their massiveness. Their large size, in relation to the bony structures in connection with them, is well shown in a vertical transverse section of the head carried through the ascending ramus of the mandible. It is evident that the functional activity of so large a mass of muscle tissue cannot but exercise considerable influence on the nutrition of the neighboring parts.

(*b*) The pterygoid muscles, springing as they do from the internal pterygoid plates, must necessarily be in close relation with the naso-pharynx, especially the internal pair, which take their origin from the internal aspect of the internal plates. I would further point out that the external pair, although they diverge from the naso-pharynx on their way to the mandibular condyles, yet remain on a level with that cavity. This close relation of the pterygoids to the naso-pharynx is, if I mistake not, of great importance in relation to the etiology of adenoids.

(*c*) Of the two pairs of pterygoids, the external pair pass in the more outward direction, forming with the sagittal plane of the head an angle of forty-five degrees. In consequence of this direction they tend by their contraction to pull the pterygoid plates and posterior parts of the maxilla away from the sagittal plane of the head, and thus to secure the normal width of the posterior nares. It is these muscles which bring about the lateral movements of the mandible, causing the lower teeth to move laterally and sagittally across the upper, the food being in this way far more effectually ground than by a mere vertical pressure of the teeth against one another.

It is a well-known fact that a bone is well-developed or under-developed according to the way in which the muscles attached to it are used. It is plainly evident to us all that the jaws do not, as a rule, attain their normal size, as is shown by the crowding of the teeth. This condition is, no doubt, in part congenital, but I believe the primary cause of the condition is in either case a lack of use of the jaws. A study of skulls of primitive peoples would seem to bear out this contention. That lack of use is the cause of this degeneracy we cannot doubt, as we know that the size, development, and health of a part depend on the blood circulation.

When a muscle is quiet the circulation is slow, and the lymph circulation is practically inactive. Let a muscle be set in motion, however, and made to contract and expand, and the blood and lymph streams become active, and with activity comes better nourishment, not only in the muscles but in all surrounding tissues. In case of the masticatory muscles, not forgetting the tongue, the nourishment must extend to the naso-pharynx, mucous membrane, and tonsils. I believe that with a more active blood circulation in the tonsils, the disease of that organ and of the body through that organ would be minimized.

INFLUENCE OF MASTICATION ON THE TEETH.

The influence of mastication on the teeth, quoting again from Dr. Campbell's work, may be indicated as follows:

The teeth being developed within the jaw-bones and remaining even after eruption in close anatomical and physiological association with them, must necessarily share in their nutritive tendencies. If these bones are efficiently exercised during the formation of the teeth—and my remarks apply especially to the permanent set—the tooth-germs will be abundantly flushed with blood, while the ample growth of the jaws themselves will provide the germs with plenty of room in which to grow and develop, and the more

* *Lancet*, July 11, 1903.

perfect their growth and development the more resistant should we expect them to be to the ravages of caries. Who can contemplate the jaw-bones of a six-year-old child, dissected so as to display all the embedded teeth, without being assured of the effect of mastication upon dental development? Fifty-two teeth meet the view; the whole region from the orbital rims to the inferior border of the mandible is literally paved with them, and I can hardly doubt that they weigh collectively more than the bone in which they are embedded. Surely no one can examine such a dissection without being convinced of the urgent necessity, if the teeth are to grow and develop normally, of giving the child's jaws from infancy onward plenty of work to do.

The ample development of the jaws which efficient mastication brings about has a further beneficial effect as regards the teeth, in that it enables them to take up their proper places in the alveolar ridges, thus securing all the advantages of a good "bite." These I now proceed to consider. The teeth during mastication, and especially when the bite is good and the food of a kind necessitating vigorous and sustained mastication, are made to move in their sockets both vertically and horizontally; the effect of this is to stimulate the circulation in the tooth-pulp, the alveolar periosteum—and hence also in the cementum and alveolar walls which are supplied by it—and the circumjacent mucous membrane of the gum. All this makes for the health of the teeth; not only does it promote the nutrition of the tooth itself and of its bony socket, thus maintaining a firm dental setting, but it also tends to secure a healthy environment for the exposed part of the tooth—that part, namely, wherein caries begins—by maintaining a healthy state of the surrounding and, indeed, of the entire buccal mucous membrane, as well as of the various secretions which bathe the mouth. Wherefore it is not surprising to find that those who masticate efficiently suffer much less from dental caries and its complications, such as abscess at the root, and disease of the periodontal membrane—*e.g.* pyorrhea alevolaris and loosening of the teeth—than those who are accustomed to bolt their food.

A few words as to the influence of mastication in wearing down the teeth. In those races which masticate vigorously the teeth in quite early adult life show signs of wearing away, while in later life it is quite common for the bitting surfaces to be worn flat; sometimes the crown of the molar is worn away so that its surface shelves downward and inward, and not infrequently it is concave, having a scooped-out appearance; often the dentin is exposed in this way, and yet among many hundreds of skulls examined I do not remember to have seen one single case where caries has started on the biting surface thus worn down.

I have always attributed this wearing down of the teeth to the friction of coarse food against them. Primitive races eat coarse vegetable food, which frequently contains grit, and this doubtless helps to grind the teeth down; but they may be markedly ground down even in those living on soft food, and in such cases the grinding away can obviously only be due to the friction of opposing teeth against one another. I, indeed, believe this to be the essential cause of the phenomenon, both in civilized races living on soft food and in primitive races, whose coarse food necessitates prolonged and vigorous mastication and a corresponding amount of attrition between the biting surfaces of opposing teeth. In order that this attrition may occur two things are requisite; the upper and lower teeth must be well opposed—there must be a good bite—and mastication must be vigorous and of the right kind. Mere vertical pressure of the teeth against one another will not wear away the opposing surfaces; there must be friction of these surfaces against one another, a transverse and sagittal movement of the lower teeth against the upper by means of the pterygoids. Mainly to this do I attribute the marked wearing down of the teeth observed in primitive peoples, and I am gratified to know that so competent an authority on dental pathology as Sim Wallace is a convert to this view.

That all the teeth may be worn down just as we observe in primitive peoples, even in those who have lived on the ordinary fare of the moderns, is proved by a case I have under observation. It is that of a man in his fiftieth year, who was brought up in Belgium, but who has resided in London for the last thirty years. When he came to my out-patient room I was not a little surprised to find that all his teeth were sound, a very unusual occurrence, I need hardly say, among the London poor at his age. In seeking for an explanation I elicited the fact that he was unable to swallow his food without chewing it thoroughly, and on giving him a moderate-sized piece of bread, with the request that he should chew it in the ordinary way, I found that he subjected it to one hundred and twenty separate bites before swallowing it, and in the steady deliberate way he went

to work and in his extensive lateral movements of the mandible he reminded one for all the world of a cow chewing its cud. The temporals and masseters of this man are enormous, and the like is no doubt true of the pterygoids; he has well-developed nasal passages, has never suffered from nasal obstruction, while his buccal membrane is unusually healthy for one of his years and circumstances. May we not attribute this healthy state of the mouth, teeth, and nose to the good effects upon them of the efficient chewing? Here is a man who has lived for thirty years in London on the same kind of food as the average poor Londoner, but instead of finding his mouth full of carious, tartar-coated teeth, and spongy, receding, pus-exuding gums, we find thirty-two sound teeth firmly set in healthy gums and all but devoid of tartar.

A word as to the wearing down of the teeth in the anthropoid apes. In this respect the gorilla differs markedly from the orang and the chimpanzee. In the skulls of these latter which I have examined the teeth show signs of wearing away, while I have found the teeth of the gorilla, with the exception of the tusk-like canines, but little worn. From this we should expect the latter animal to be mainly carnivorous, and the orang and chimpanzee to be largely herbivorous.

I wish I might enter more deeply into the subject of mastication, and call your attention to the evidence of instinct to masticate, and also to the causes that have resulted in insufficient mastication, but I shall consider the physiologic side instead.

In view of the interest in mastication that has been growing out of so-called "Fletcherism" during the last few years, the physiologic phase of the subject is the most interesting as well as the most practical. Regardless of our individual opinions as to the merits of Fletcherism, we dentists can all agree that Horace Fletcher is one of the greatest benefactors to our profession that the world has produced. Having confidence that the correct use of the organs of mastication is of the greatest importance to the health of the body, we feel that his work will live to be a lasting benefit to all posterity. It is somewhat to our shame as physicians and dentists that it remained for a layman to rediscover and teach the people the physiological value of their teeth. The work of Fletcher, great and far-reaching in itself, has been ably supplemented and put on a scientific basis by such men as Sir Michael Foster, Russell H. Chittenden, and others, while Irving Fisher has been experimenting with the economic end in view. The results of these experiments are of such interest that they have attracted the attention of the whole world.

Briefly, "Fletcherism" means—

(1) Thorough mastication of all food except water to a point of involuntary swallowing, with the attention fixed on the taste of the food and not on the act of chewing.

(2) Never eat when not hungry, and always stop when the appetite has been satisfied.

(3) Consult the appetite and eat what is craved.

(4) Never eat when the mind is in a disturbed condition.

By following these methods of taking food, Mr. Fletcher claims that energy will be enhanced and muscle endurance will be increased from fifty to two hundred per cent., according to the room for improvement. Symptoms of headache and lack of energy will cease; fatigue will practically become a thing of the past, sleepiness being the only indication of fatigue. The quality of the muscles will become so much improved that one is able to lift weights twice as heavy as he would be when full of toxins. The amount of food required, especially proteids, is reduced.

Mr. Fletcher is himself a living example, supporting his contentions. At forty-six he was refused life insurance, and had, so to speak, one foot in the grave. A few years later, solely by following these laws, he equals some of the best records of young athletes and is in the "pink of condition." He also refers to a Mr. Stapleton, formerly of Yale gymnasium, who was enlisted for the experiments under Professor Chittenden. He went at them half-heartedly, because he felt that he was already in a superior physical condition. His energy, strength, and endurance were in-

creased one hundred per cent. or more, as a result of a better quality of muscle, not of more training.

Among many other examples was a man who by thirty days' trial of these principles was able to increase the number of times he could perform deep-knee bending from 3000 to 5002 times, and among the many thousands of people who have adopted Fletcherism there are many other examples as pleasing as these.

Sir Michael Foster gave Fletcherism the first scientific stamp of approval, and he was quickly followed in one way or another by many European and American physiologists and physicians. It is not to be hoped that all would be as enthusiastic as the originator, nor was it desirable that they should be until after a more thorough investigation.

Skepticism as to Fletcherism was mainly centered about the reduction in the amount of food, especially proteids, taken. The dietary standards of Voit and Atwater were reduced by two-thirds in case of proteids and one-third in total fuel value.

To ascertain if bodily equilibrium could be maintained on such a reduction in foods, Professor R. H. Chittenden of Yale University instituted a set of experiments, taking for his first subject Mr. Fletcher himself. Professor Chittenden knew that there was a great need for a more thorough physiological study of the laws of nutrition, and he shared the general belief that lack of a proper physiological condition of the body was more responsible for the physical, moral, mental, and social ills than any other factor. Mr. Fletcher was under observation in the laboratory of Sheffield Scientific School for thirteen days, and his excretions were analyzed daily to ascertain the amount of proteids metabolized. The result showed that a very close approach was made to nitrogenous equilibrium.* Following this experiment, Professor Chittenden conducted a series of tests on (1) a group of college professors, (2) a group of volunteers from the army, and (3) a group of athletes. The three groups, you will notice, were taken from classes of people doing mental work, mild manual work, and those undergoing excessive muscular exertion. The result of these experiments seemed to plainly indicate that the human race consumes about twice as much proteid food as is needed and an excess of carbohydrates, and that mental as well as physical health and efficiency are improved with the reduction of food which can be accomplished automatically by a thorough mastication.

The experiments of Professor Irving Fisher, the political economist of Yale, were similar. Nine healthy students were used in this experiment, which was to test the effect of a thorough mastication on endurance.* Professor Fisher was assisted in these tests by Professors Chittenden, Underhill, Mendel, and Rettger, and by Drs. Foster and Anderson. Quoting from Professor Fisher's report: "The object of the first half of the experiment was to test the claims made by Mr. Horace Fletcher as to the effects upon endurance of a thorough mastication combined with implicit obedience to the appetite. Our conclusion in brief is that Mr. Fletcher's claims, so far as they relate to endurance, are justified." Briefly, during the first half of the experiment the two rules (1) thorough mastication, (2) follow instinct, were employed, and during the second half another rule was added, (3) when instinct is in doubt, use reason.

I regret not to be able to go into the detail of these experiments, as it is not my object to speak on Fletcherism or any other method, but to establish the fact that the teeth play an important part in the health and nourishment of the body.

At the meeting of the New York State Dental Society, May 1909, the Correspondent, Dr. H. C. Ferris, reported that he had sent the following letter to one hundred and fifty men of science:

* "Physiological Economy in Nutrition," by Russell H. Chittenden, *Popular Science Monthly*, June 1903.

* Publications of Yale University, May 1907.

My dear Doctor,—As Correspondent of the New York State Dental Society I am addressing you in behalf of science, and earnestly solicit your consideration of and reply to the following questions:

(1) Do you consider imperfect mastication and salivation of food an etiological factor in diseases of the stomach and intestines?

(2) If so, what pathological conditions result from such neglect?

(3) Will you briefly state your scientific reasons for your beliefs.

Dr. Ferris received replies to this letter from the following men: G. V. Black, Northwestern University; Leo F. Rettger, Yale University; A. Wadsworth, Columbia University; R. H. Chittenden, Yale University; Max Einhorn, M.D., New York; Horace Fletcher, New York; Glentworth R. Butler, Brooklyn; Bernard R. LeRoy, Athens, Ohio; J. P. Buckley, Chicago; George F. Laidlaw, M.D., New York; Eugene S. Talbot, Chicago; Jacob Fuhs, M.D., Brooklyn; Truman W. Brophy, Chicago.

The answers to this letter were varied. Mr. Fletcher was sailing for Europe and could not go into detail concerning the questions; Dr. LeRoy did not commit himself because the questions were limited to diseases of the stomach and intestines; Professor Chittenden was conservative—but in every other case the opinion was given that mastication was important. Among the diseases mentioned in answer to question No. 2 were catarrh of the stomach, functional disturbances of the stomach, imperfect digestion, gastro-intestinal catarrhal conditions, gastric ulcer, carcinoma, hyperemia, excessive secretion of mucus, hyperchlorhydria, interference with function of pylorus and cardia, cardio-pyloric spasm, impairment of absorption, flatulency, and some others of a more general nature.

We probably could not all agree that all these maladies are caused wholly or in part by imperfect mastication, which is really immaterial to the subject. The fact that some of these diseases are due to a neglect of the functions of the teeth is sufficient to establish our point.

Before closing, I wish to call your attention to the appointment of a Committee on Hygiene by the State Dental Society. This committee has organized a Dental Hygiene Council, and has shown its good judgment by making Dr. John McCall of Binghamton chairman. It is to be hoped that the medical and dental professions will lend their hearty support to this work, for it is the duty of the one profession to care for the organs which watch over the outer door and to teach their use; and the duty of the other, the older and more learned profession, to assist in this teaching as well as to repair the wrong. We each have our departments, and yet one cannot accomplish the greatest good without the help and support of the other. If there have ever been in our hearts any unworthy feelings, let us cast them from us, and unite our forces for the betterment of humanity and our professions.

THE ACTION OF FORMOCRESOL.

By HOWARD R. RAPER, D.D.S., Indianapolis, Ind.

DR. J. P. Buckley of Chicago has given the dental profession a very valuable remedy, namely, formocresol, a description of which may be found in Johnson's new "Text-book of Operative Dentistry," or Buckley's "Modern Dental Materia Medica, Pharmacology, and Therapeutics." Perhaps Buckley was not the first to use the now popular mixture, as Prinz, in his late work on materia medica and therapeutics, suggests. But the fact remains that Buckley is the man who gave it to the profession and gave it in such a way that the profession accepted it.

Formocresol is a mixture of equal parts of formalin and cresol. Formalin is a 40 per cent. solution of formaldehyd gas in water. It is a strong, penetrating, irritating disinfectant and deodorizer. Cresol, a liquid, is a coal-tar product, whose disinfectant properties rank a little below those of formalin and a little above those of phenol. It is much less penetrating and irritating than formalin. Modified formocresol is formocresol plus a variable amount of additional cresol.

The mixture, formocresol, is today used more, perhaps, than any other agent by men who desire to treat putrescent pulps scientifically. A pledget of cotton saturated with formocresol may be placed in the pulp-chamber and hermetically sealed in teeth the pulp-canals of which are full of putrefying, gas-producing pulpal tissue, without producing an abscess—presuming, of course, that the operator's technique is good, that none of the putrescent matter has been forced through the apex by faulty instrumentation, and that no pressure is brought to bear on the cotton while being sealed in the pulp-chamber.

What, then, becomes of the gases that before the advent of formocresol used to force aseptic matter through the apical foramen? One of two things—either they are no longer formed in the presence of the remedy, or, if formed, they are in some way destroyed.

Buckley accepts the latter hypothesis, and advances the following theory:

The gases produced in pulp decomposition are ammonia (NH_3), hydrogen sulfid (H_2S), and carbon dioxid (CO_2). When the formaldehyd gas (CH_2O) of the formalin comes in contact with the ammonia gas of pulp decomposition, they unite chemically, forming a solid (urotropin) and a liquid (water). $6CH_2O + 4NH_3 = (CH_2)_6N_4 + 6H_2O$. Formaldehyd gas likewise makes a chemical union with hydrogen sulfid, forming a solid (sulfur) and a liquid (alcohol). $2CH_2O + 2H_2S = S_2 + 2CH_3OH$. Carbon dioxid is considered to occur in such small amounts as to be of no consequence. But the pulp is not decomposed entirely into gases, of course; there are other products of pulp decomposition. Buckley names three ptomains, *i.e.* cadaverin, putrescin, and neuridin, and two amido-acids, *i.e.* tyrosin and leucin. To quote Buckley: "It is stated on good authority that . . . formaldehyd, united with basic ptomains, forms inodorous compounds. By the use of formaldehyd, then, the *irritating gases* and *poisonous liquids* (largely ptomains) are changed chemically into *non-irritating* and *non-poisonous liquids and solids.*"

Buckley does not overlook altogether the germicidal and antiseptic action of his remedy, but he considers or seems to consider the chemical action a great deal more important.

While making notes preparatory to writing this paper the author has read

the chapter on putrefaction in no less than six authentic works on chemistry and bacteriology; he has also read all pertaining to this matter in standard pathologies, operative dentistries, dental medicines, and the like, and has come to the following definite conclusion: The putrefactive process is a process science knows very little about, except in a general way. We know that bacterial action on nitrogenous matter, under favorable circumstances, brings about putrefaction, and that in this process complex bodies are broken up into bodies of simpler formulæ, but the exact chemistry of putrefaction is still a matter of much conjecture and confusion.

As far as the author is able to learn, no competent chemist has ever studied in an experimental way the chemistry of pulp decomposition. Our knowledge of this matter is based on what we deduce by applying our knowledge of the putrefactive process to what we know of the chemical composition of the pulp, and not by actual experiment. Such knowledge is subject to great inaccuracies.

McFarland, the bacteriologist, summarizes the change in the putrefactive process thus: "Albumins to peptones; peptones to a large number of gases, acids, bases, salts, ptomains."

Miller, in his "Micro-organisms of the Human Mouth," quotes Flügge, who in speaking of the products of putrefaction names eighteen acids, five gases, two bases, then indol, skatol, tyrosin, and its derivatives of the aromatic series, and lastly, ptomains. All of these products do not occur in any one case of putrefaction. The products vary according to the substance acted upon, the temperature, the amount of oxygen and moisture, and the bacteria involved. But the enumeration of the products gives us some idea of the complexity of the process and the consequent lack of definite knowledge concerning it.

Buckley names ammonia, hydrogen sulfid, and carbon dioxid as the gases of pulp-putrefaction. But there is no theoretical reason why hydrogen, nitrogen, marsh gas (CH_4), ammonium sulfid ($(NH_4)_2S$), and phosphoreted hydrogen (PH_3), all being gases of putrefaction, should not occur in pulp-decomposition. Considering the amount of phosphorus in the pulpal tissue, the amount of phosphoreted hydrogen produced in its decomposition would of necessity be infinitesimal; but there is no conjectural reason why hydrogen, ammonium sulfid, nitrogen, and marsh gas should not occur freely.

After the ptomains, besides those three named by Buckley, which, theoretically, may occur in pulp decomposition, come trimethylamin, sapin, methyl guanidin, neurin, and betain.

Add to the gases, ptomains, and amido-acids named, the gases, ptomains, and amido-acids yet undiscovered, also toxins, bases, acids, salts, and aromatics, and the incomprehensible complexity of the chemistry of pulp putrefaction will be appreciated.

It is presumed that in practically all cases where the technique is good, formocresol gives results. The question to be considered here is, How are these results obtained—by the chemical or the disinfectant action of the remedy?

We have seen Buckley's stand in this matter. Prinz says: "Regarding the action of formaldehyd on a putrescent pulp, it should be remembered that its combination with the gases resulting from the decomposition of the pulp is of less importance to the welfare of the tooth than its destructive action on the bacteria and their products." Omit the "and their products," and Prinz expresses the writer's idea exactly.

It is hard to accept the chemical theory, first, because it does not explain fully what becomes of all the products of pulp-decomposition, but disposes of only two gases in a satisfactory manner, leaving other gases to occur in "minute quantities," and the other products of putrefaction to be acted upon in a "favorable" but mysterious manner; second, because, as no report of experiments could be found by the writer, the theory presumably rests on the inaccurate and incomplete knowledge of the chemistry of the putrefactive process; third, be-

cause the explanation of the action of formocresol on truly bacteriological grounds is much more plausible and comprehensible.

The action of formocresol, then, is principally, if not wholly, that of a powerful penetrating germicide and antiseptic. It stops the putrefactive process by killing or rendering inactive the bacteria which cause putrefaction. It does this when other germicides and antiseptics fail, because of its gaseous and penetrating nature. The author has no reason to suppose that the chemical changes suggested by Buckley do not occur, but believes them to be of minor importance only.

The remedy, then, is to be applied as a penetrant, when the canals contain putrescent matter, never farther than one-third the way into the canals, and not at all when the canals are cleaned of putrescent material, and when cresol or creasote is indicated and may be easily placed into the canals.

Those who believe strongly in the chemical theory of the action of formocresol are inclined to "seal up any tooth at the first sitting." This the writer considers to be bad practice. When there is a very great deal of gas production he would advise leaving the tooth open, that is, after opening the orifices of the canals and making a cresol application in the pulp-chamber, the chamber is sealed only with cotton, and the dressing is allowed to remain for from twenty-four to forty-eight hours, at the end of which time formocresol may be hermetically sealed in the pulp-chamber with cement.

To quote Buckley: "Whenever pus can be mechanically removed, it is always better to dispose of it by this means rather than to do so by the use of some chemical agent." This is a very sensible and truthful statement, and applies to gases as well as pus. It is bad surgery to stop a copious flow of gases by sealing the tooth, depending on a chemical agent to destroy them.

If formocresol is regarded as a powerful, penetrating, irritating antiseptic and germicide, it will be found to be a most useful mixture in the treatment of putrescent pulps.

The reader's attention is called to another of Buckley's remedies, *i.e.* phenosulfonic acid. In a few months it has grown indispensably useful to the writer. Literature concerning it may be found in Johnson's new "Text-book of Operative Dentistry" or Buckley's "Modern Dental Materia Medica, Pharmacology, and Therapeutics."

CORRESPONDENCE.

A REPLY TO DR. SUMMA.

To the Editor of the Dental Cosmos:

Sir,—I should like to enter your columns to reply to the letter of Dr. Summa of St. Louis published in your February issue, which has just come to my attention.

Dr. Summa's criticism, like most of the criticisms of the dental hygiene campaign, reveals ignorance of certain of the factors bearing on the subject.

If the articles in the New York *American* had been prepared by the National Association's Committee on Oral Hygiene or the New York State Dental Hygiene Council, or if the articles when prepared had been *visé*'d by any member of an official oral hygiene committee, Dr. Summa's protest might be considered well founded. As it happens, however, the articles were inspired by a dentist not a member of any such committee, so far as I know. When he informed me that the articles were to appear, I protested vigorously to him against their publication unless previously submitted to our committee for correction and authorization; he then informed me that he was unable to get the publishers to so submit the articles. The signed statement of the chairman of the Oral Hygiene Committee, N. D. A., was not appended by him to the prepared article, and therefore did not give the authorization it appeared to do.

The harm done to the cause of oral hygiene by this and similar bits of "sensationalism" will, I think, be found negligible except as these articles arouse the opposition of members of our profession.

Those who have given this matter much thought and have put time, energy, and money into actual constructive work looking toward the improvement of national health through dental hygiene, which is stated to be the ultimate object of this movement, have come to the conclusion that only through proper publicity can this broad result be obtained. The movement, as an organized one, is in its infancy, and until organization has been further perfected it may not in all cases be possible to obtain the "proper publicity" which is one of our aims. This should not, however, cause the movement to be condemned by broad-minded men. Let me say here that if those who are so ready to criticize would co-operate with the oral hygiene committees authorized by the National and state societies, and *work,* it might not be so necessary to resort to this publicity, with its occasional "sensational" outcrop.

Dr. Summa quite unwittingly states one of the objects of the educational campaign when he says that the teeth of the "unfortunate . . . . could only be cared for at the expense of some charitably inclined community or individual." To secure the establishment of free dispensaries for the benefit of this class is surely in itself a worthy object of an educational campaign. As to the questioned ninety-two per cent., as the proportion of our total population who neglect care of the teeth because of ignorance, let Dr. Summa ask his own patients their conception of the teeth, and then tell us the percentage of those who realize the bearing of the teeth and their care upon mental and physical health.

Yours truly,

John Oppie McCall,
Chairman N. Y. State Dental Hygiene Council.

Binghamton, N. Y., March 23, 1910.

PROCEEDINGS OF SOCIETIES.

MARYLAND STATE DENTAL ASSOCIATION AND THE DISTRICT OF COLUMBIA DENTAL SOCIETY.

Fourteenth Annual Union Meeting, Washington, D. C., October 28-30, 1909.

(Continued from page 350.)

FRIDAY—*Evening Session.*

The meeting was called to order at 8 o'clock P.M., Friday, October 29th, by Dr. McClenahan.

Dr. D. D. SMITH, Philadelphia, Pa., read a paper entitled "Clinical Lecture on Prophylaxis."

Dr. MCCLENAHAN. The next essayist is a gentleman whom I need hardly introduce to you in Washington, because we all know him. I will call upon Dr. F. W. Stiff of Richmond, Va. [Applause.]

Dr. F. W. STIFF then read a paper entitled "What Medicine and Dentistry Need," as follows:

WHAT MEDICINE AND DENTISTRY NEED.

The foundation of this paper is laid in the following premises—(if the foundation is weak, the superstructure cannot be strong):

(1) Medicine is a science which treats of the diseases of the human body, their prevention, and their cure.

(2) To become thoroughly competent to practice upon one part of the body, it is necessary to possess a knowledge of the whole.

(3) Any association of men scientifically treating the diseases of a special part of the human body must, accepting the premises laid down, be a branch, a specialty of medicine.

(4) Dentistry, treating the diseases of the oral cavity, must be a branch of medicine, since the oral cavity is a part of the human structure.

If all of these premises were accepted I would not burden you further; but as I know that there are some who take issue with me, I shall beg your indulgence while I give a few reasons for my views.

All the parts of the body are closely associated and connected. The systems of arteries and veins extend to all parts, and the blood which circulates in the pulp of a tooth may the next minute be coursing through the veins of a toe. Each part and function is so correlated with and interdependent upon all other parts and functions that a knowledge of the whole is necessary for the full understanding of a part. Talbot well says, "The teeth are not a law unto themselves, they are a part of the entire body. Diseases that affect one part of the body must affect the teeth. The food that nourishes the body must nourish the teeth. Embryogeny, developmental pathology, and the central nervous system enter into the structural development."

Some of the diseases of the general system have their origin in or about the mouth, and for diagnostic purposes a thorough knowledge of disease manifestations in the oral cavity is extremely desirable; therefore the principles of dentistry should be taught to medical students.

Physicians should know the theory of dentistry, if for no other reason than that they may be able to give valuable and timely advice to parents regarding their children's teeth. What a field for usefulness! I would insult your intelligence as practicing dentists if I were to go into details of what such a knowledge would be worth to a physician and his patients in preventing pain, irregularity, and the ills incident to imperfect mastication because of abscessed teeth, exposed nerves, and other ills not necessary to name. Almost every day of my practice I think, Oh, if I could have seen this little mouth sooner! and the mother can only say, "I did not know." Alas! she has not had a chance to know what she should have known. But that is another story, and an interesting one, too. Let us therefore try to look beyond our noses and a little way into the future of our profession; let us not only move to teach dentistry to the physician, but impart to the people as a whole what they should know about their teeth. We shall not be doing our duty as a profession if we do not do both.

I have of course not exhausted the reasons why the medical student should study, as a part of his course, the theory of dentistry. I could not do so in a paper adapted for such an occasion, but I trust that I have said enough to convince some of the need of such a movement.

The weakness of dentistry is that it does not require a knowledge of the diseases of other parts, many of which are closely related to the oral cavity. Dentists should cease to practice under the D.D.S. degree, and should qualify for and practice under the M.D. degree. I hope you may be patient with me while I mention a few reasons.

We would not then be occupying the anomalous and embarrassing position of practicing a specialty of medicine under a separate degree. We would occupy a position equal to that of the medical profession, for we would be a part of that profession.

We would be better equipped for our work and would labor with the rest of the medical fraternity in preventing and curing the diseases of the body in general. We stand at the gateway of the body, where we can recognize in their incipiency many of the diseases which cause so much suffering and death to the human family. After we have recognized these maladies by manifestations in the mouth, the patient should, of course, be referred to the proper specialist for early treatment.

We shall not be able to claim to have initiated the movement toward putting dentistry on a plane with other specialties of medicine. Several European countries have taken advanced steps in this direction, and we are laggards in the race. There has been organized in Italy an Institute of Stomatology, in which only graduates of medicine can secure instruction in the dental branch. France and Hungary have taken similar action, and in Australia and Belgium in three years from now only medical men will be able to secure license to practice dentistry. Thus five European countries are blazing the way for the return of dentistry to the family of medicine. I say *return* advisedly, for in the early days, before the dental college, all practicing dentists of any note were physicians.

Just a word as to what is being done in our own country. So far as I can ascertain, Virginia is the first state that has made an effort to legislate on this question; North Carolina followed at its last state meeting. For several years a committee representing the Virginia State Association has been trying to solve the problem of how best to do the work. The movement has been indorsed by every body of professional men before which it has been presented, except one. The following organizations have indorsed it and agreed to lend a hand: The Virginia State Association, the North Carolina State Association, the Medical College of Virginia, the Tidewater Dental Association, the Elizabeth City County Medical Association, and the Richmond City Dental Society. Besides these bodies, many of the most prominent physicians, surgeons, and

educators in the state have heartily indorsed the movement, among them the superintendent of public instruction and the president of the state university.

Some of you are perhaps satisfied with conditions as they are, and are opposed to this movement toward placing dentistry formally in the family of medicine, but I believe that the time will come when this will be done. I should be proud if any word or effort of mine contributed ever so little to that end.

Discussion.

Dr. R. Grady, Annapolis, Md. One thought that I should like to emphasize is the medical aspect of dental surgery. The therapeutics of dentistry, not the filling of teeth or the making of plates, gives us the status of professional men; we are only artizans when we do that work. From the first, the dentists who have really accomplished anything, the writers, investigators, authors, teachers, etc., have been medically educated. Men who practiced dentistry as far back as 1800 were medically educated as well as skilful operators and artistic mechanics, and the work which they did and the records which they have left behind place them as peers among professional men. All the members of the first faculty of the Baltimore College of Dental Surgery were entitled to affix M.D. to their names, and the best dentists in those times—about 1840—fully appreciated a medical education for the dental practitioner. Horace Hayden was licensed to practice dentistry under an act regulating the practice of medicine and surgery in Maryland, and received an honorary M.D. degree from the University of Maryland, every member of whose dental faculty today is an M.D., D.D.S. In this connection I had believed that Dr. Hayden had delivered dental lectures to medical students in 1837–38, although I knew that the faculty of the University of Maryland had told Dr. Harris that the subject of dentistry was of little consequence. I have been surprised to learn that no one has so far been found who could say positively when or where those lectures were delivered; nor can this be determined by any trustworthy record. Dr. Hayden believed that the dentist, in order to be qualified in his profession, should be thoroughly educated in the science of medicine, and said that we assume the title and claim the rights and privileges of being the successful cultivators of at least a branch of the science of medicine.

When the Harvard Dental School was established, it was insisted with firmness that all professors, dental as well as medical, should be graduates in medicine. It was the original expectation to confer the degree of D.D.S. It was found, however, that a degree had never been conferred upon dentists by a classical institution, that the Baltimore College of Dental Surgery, which originated the degree of D.D.S. had written the diploma in Latin, and that the degree which it had always given was "Chirurgiæ Dentium Doctor," the proper initials of which would give a C instead of an S, and two D's. It was finally decided to modify the old degree M.D. (Medicinæ Doctor, Doctor of Medicine) by the prefix Dentariæ, which met classical requirements and gave a distinctive title, D.M.D. Dr. Talbot has said that the very title, Doctor of Dental Surgery, has so closely and exclusively limited the profession, as it is called, that the dentist is known to the laity as doctor of the teeth, and Dr. Brown has said that if the dentist chooses to ignore the medical aspect of his calling, he ought to leave out the word "Surgery" and call himself doctor of dentistry, not doctor of dental surgery or doctor of dental medicine. I did not know, until Dr. Stiff told us tonight, that a medical education for dentists is recognized at so many places at home and abroad.

Another thought occurs to me. When Dr. Stiff wrote me about his subject I sent him the report of the special committee of the American Dental Association in 1895 on the classification of dentists as manufacturers by the Census Bureau in 1890. Some of you, of course, were hardly in the profession when the last fight was made fully nineteen years

ago. I was the first one in the whole United States that the Census Bureau came after, and finally I was threatened with the penalties provided in the census law for refusing information. I was a marked man for one of the first victims, because of my having originated the opposition. Ten thousand dollars fine and a year's imprisonment was the penalty, if you remember the story. One thing that protected dentistry in 1880 —when General Walker, who edited the report of the International Exhibition in 1876, was chief of the Census Bureau —was that the dental exhibits, *i.e.* twenty-two specimens of prosthesis and orthopedy, embracing pivot teeth, dentures, complete and partial, with and without spiral springs, the various methods of retention by atmospheric pressure and by clasps, and a series of orthopedic apparatus for the correction of congenital malformations of the palate, and loss by scrofulous and syphilitic necrosis, on the testimony of the judges (no one of whom was a dentist, all being engaged in medicine and surgery), were surgical.

The next order of business was a paper by Dr. H. A. Kelley, Portland, Me., entitled "Military and Naval Corps."

Dr. M. F. Finley, Washington. Mr. President, I have a resolution that I should like to have voted on. We had a representative from the department of Agriculture here last evening, and upon his suggestion I offer this resolution:

The Maryland State Dental Association and the District of Columbia Dental Society, meeting in joint assembly, recommend to the National Dental Association the organization of a commission or council to investigate the composition and purity of tooth-powders, pastes, and mouth-washes, also all drugs that are furnished for application by dentists as a part of their armamentarium, and establish whether or not they contain harmful ingredients, based on a view of the value to the practitioners of medicine of the work of the Council of Pharmacy and Chemistry established under the auspices of the American Medical Association, being assured of the interest and assistance of the officials of the Bureau of Chemistry, United States Department of Agriculture.

The resolution was seconded and was unanimously adopted.

Dr. Grady. I desire to offer this resolution:

Resolved, That this meeting disclaims the indorsement or advocacy of any secret or proprietary preparation.

The resolution was seconded and was unanimously carried.

The meeting then adjourned until Saturday, October 30th, at 1 P.M.

Saturday—*Afternoon Session.*

The meeting was called to order by Dr. McClenahan, Saturday, October 30th, at 1 P.M.

Dr. McClenahan. We have yet to hear the report of the special committee appointed by Dr. Smith, in regard to a union meeting organization.

The report of the committee was read by Dr. London of Washington, D. C., recommending that the two societies form a permanent organization for the more expeditious preparation for the yearly meeting, such organization to elect its own officers, etc.

It was moved and seconded that the report of the committee be adopted.

Dr. D. E. Wiber, Washington, D. C. Mr. President, I should like to move a substitute for the motion, namely, that this whole matter referred to the special committee be referred to the several societies, the District of Columbia and the Maryland societies, so that it will reach them at their next meeting and they may vote upon it intelligently.

The substitute motion having been seconded and put, was unanimously carried, whereupon the meeting adjourned.

Following is a report of the sessions devoted to

Discussion of Clinics.

(Friday Afternoon.)

The meeting was called to order at 2.30 P.M., with Dr. McClenahan in the chair.

Dr. McClenahan. We meet this afternoon for the discussion of the clinics held this morning, and I will ask Dr. Crane to take charge of the meeting.

Dr. A. B. Crane, Washington, D. C. Gentlemen, it has been the custom heretofore, in the discussion of clinics, to call upon the clinician to make a statement of the work he has done, and then to call for a discussion which is closed by the clinician, but today we are going to call first for the discussion.

"TARTAR SOLVENT."

Dr. Crane. The first clinic open for discussion is that of Dr. Joseph Head, Philadelphia, Pa., on "Tartar Solvent." Is there anyone who would like to discuss the subject as demonstrated by Dr. Head?

Dr. M. F. Finley, Washington, D. C. I am sure from having seen Dr. Head's clinics in many other places, and from having utilized the bifluorid of ammonia myself, that it renders wonderful assistance in pyorrhea cases and in all cases of concealed pus. This tartar solvent has proved to be absolutely harmless to tooth tissue, as has been demonstrated by leading men in the National Dental Association and in the New York State Dental Association, by individuals whose work is sufficient to settle this question in the mind of anyone present. We do not need to go into that demonstration to prove that this solvent does not injure enamel tissue or the cementum. It has been demonstrated that it softens deposits of tartar, no matter how deep in the pocket surrounding the tooth the deposit is, if the application is made as Dr. Head suggests, that is, by inserting the syringe to the bottom of the pocket, releasing the pressure sufficiently to allow the fluid to pass out of the syringe, and flooding the pocket. Statements have been made by some regarded as conservative men in the profession that the solvent should be inserted with a flattened wood stick or with a solid platinum point, or with a pair of pliers, allowing the drop to pass into the pocket. That, to my mind, does not give the solvent the opportunity that it must have to do its work. Every pocket, it makes no difference how much you attempt to dry it, will immediately refill with the oral fluids and with the weeping of the tissues, because the tissues are in a condition to exude fluids, owing to the irritation that has existed for a long time, and unless the drug is applied in sufficient quantity to absolutely flood the cavity and drive out all the other fluids, the full effect of its solvent power on the tartar is not obtained.

There is, of course, an opportunity for this preparation to do injury, unless the directions are followed explicitly. It must not be left in the pocket over two minutes, and no excess must be allowed to remain on the gum without wiping it away and rinsing the mouth. Water is usually sufficient if the solvent has overflowed on the gum, and in case of a burn the pain can be neutralized absolutely by milk of magnesia, as I know from applications in my own mouth.

Dr. Head has benefited the profession beyond estimation by having suggested this solvent that can be used by every dentist. There is no reason why we may not all feel absolutely safe in handling it. He has induced the manufacturers to produce a syringe the transparent barrel of which enables the operator to see the amount of liquid.

Dr. L. A. Meyer, Baltimore, Md. About six weeks ago Dr. Head demonstrated his wonderful preparation before the Baltimore Dental Club, and I immediately procured a bottle of the tartar solvent and started to work after Dr. Head's directions. I have a most severe case of pyorrhea alveolaris to treat. Since applying the tartar solvent, about four weeks ago, I have seen the most marked improvement in this case. My patient has not experienced any burning, as within two or three minutes after in-

serting the tartar solvent I have insisted on rinsing the mouth thoroughly.

Dr. Julian Gartrell, Washington, D. C. I desire to mention only one point that I noticed particularly this morning in Dr. Head's clinic. I think I am competent to speak on that point, because I was using my own instruments that I am accustomed to use for treating pyorrhea, and know just about the feel of the different forms of pyorrhea under these instruments. I was particularly anxious, and at my suggestion the doctor very kindly allowed me to use those instruments upon the tooth in which he had inserted the tartar solvent. I found that there was a great difference in the feel of the instruments after he had inserted the solvent. The tartar was more chalky. It did not require half the force to remove it that I am accustomed to exert in using the same instruments. I simply wanted to mention that point. The tartar solvent will prove, I believe, of great service to us in the treatment of pyorrhea.

Dr. H. F. Gorgas, Baltimore, Md. I was very much interested in watching the clinic of Dr. Head. I had never seen the tartar solvent being used before, but I had read of it. I noticed that Dr. Head allowed it to remain from half a minute to two minutes, and I saw him try to remove the tartar before the application of the solvent and then afterward, and noticed, as Dr. Gartrell has just said, the ease with which the tartar was removed. We have desired and needed something like this for a long time. The only question in my mind is whether the solvent has any effect upon the tooth structure. A number of men who are prominent in the profession have tested this solvent and have stated that it has no deleterious effect upon tooth structure. That closes the argument, I think. As the removal of tartar at best is a painful operation for the patient, anything that will relieve pain by shortening the operation will benefit the patient and us also.

Dr. T. S. Waters, Baltimore, Md. Dr. Head has brought to us something that we have needed in the profession for a long time. I do not wish to discuss the subject theoretically, but practically, and my experience with the solvent is that it is a solvent, and the doctor has given us something that will aid us very materially in treating pyorrhea conditions. My experience with it has been nothing but favorable. I have treated a chronic case that for some time had given me quite a good deal of trouble and anxiety. I could relieve the disease to a certain extent so as to make the patient more comfortable, but the teeth would not tighten. Since I have been using the solvent and following Dr. Head's directions, I am meeting with considerable success, and in this case the teeth are tightening up, very much to my surprise. This solvent is a great help in the removal of the deposits with instruments. I find that I can use more delicate instruments, and thereby save the patient much severe suffering.

Dr. W. C. Fisher, New York city. I noticed one point which Dr. Head brought out in his clinic this morning. He warned us not to shirk instrumentation. I should like Dr. Head to emphasize that still further in his discussion. No matter what this tartar solvent may do, the tartar around the roots of the teeth must be dislodged with instruments. Of course, if this remedy will soften the tartar, instrumentation will be much easier, not only for us but for the patient, and a cure will be almost sure. The great difficulty in the past consisted in dislodging the tartar with instruments.

But I would like to give a note of warning to the younger men of the profession. I watched very closely the manner in which Dr. Head used his remedy. He took every possible precaution to protect the tissues, and he constantly asked the patient, "Do you feel a stinging sensation?" He was furthermore very careful to time the period which he allowed the drug to be on the soft tissues before allowing the saliva to somewhat dilute it. These are points that the young practitioner must watch, for he is inclined to be an enthusiast, and may think that he can inject Dr. Head's remedy into

the pockets, dismiss his patient, and inject again in three days or a week, as Dr. Head suggested, and effect a cure without careful instrumentation. I am very glad that Dr. Head emphasized the necessity of instrumentation. I found in my studies for the past six or eight years that the main factor in the treatment of pyorrhea is careful instrumentation, for unless the tartar is removed the gum tissue will not cling to the roughened surfaces of the root, and no drug can be procured that will dissolve tartar and eliminate it at the same time. The tartar is simply softened, and must be removed by instruments.

Dr. HEAD (closing the discussion). There has been such a free discussion and the subject has been so thoroughly covered that there does not seem very much for me to say. Dr. Finley spoke of the Dunn syringe, which has rendered the application of the solvent extremely easy. It has a celluloid barrel, which I find is unharmed by the solvent, and makes it so that we can apply it with just the same ease as though we were using the glass syringe. Glass ordinarily cannot be used with the solvent, because the latter dissolves glass.

What Dr. Fisher said concerning instrumentation I consider most valuable. This solvent when applied to gums inflamed by tartar will unquestionably palliate the irritation; it will make the teeth feel more comfortable, but just as sure as you leave lumps of tartar down in the pockets, just so sure you make it impossible for that gum to re-adhere to the roots, and until the gums do re-adhere, pyorrhea cannot be cured. There is this consolation, however: While it takes an hour to three hours' immersion of a tooth in the solvent to soften an adhering lump of tartar, which is purely chemical action, by some curious good luck a therapeutic action of the solvent in the mouth, combined with the temperature and the live tissues, seems to be ten or twenty times more effective. While out of the mouth it takes complete immersion of the tooth to dissolve or loosen the tartar, a drop or two placed in a pocket in the mouth has the remarkable property of attacking the bond between the tartar and the root, making it easily dislodged, and at the same time making the entire mass of tartar much softer. The particular advantage of the solvent lies in the fact that when you have succeeded in scraping all but a microscopic film of tartar from the root, if you cannot reach that film, this tartar solvent will dissolve it.

If a patient comes to you with a very sore and inflamed mouth and the gum is very sensitive, I should advise the application of the solvent alone two or three times, without any attempt at instrumentation. The tartar solvent has the property of taking away sensitivity at the necks of the teeth. While it does not attack the cementum, it seems to have the power of attacking the nerve fibers within the cementum, so that where teeth are sensitive and cannot stand hot and cold water, three or four applications of the tartar solvent will make them so that the mouth will become quite comfortable; the scaling can then be continued, and the applications of tartar solvent will have so loosened the tartar that it can be readily removed.

When the solvent has been used three or four times and the scaler is put up there in an exploratory search, you will note when the tartar is gone from the fact that the cement has a velvety, almost oily surface, so that the instrument passing over it proves it absolutely smooth. After that is done, you will find each week, as you apply your solvent to the pockets, that you cannot get the needle of the syringe up quite so far each time, and if you try to get it up the full length, as you did originally, you will get blood. The pocket will become shallower and shallower, until finally there is complete adhesion between the tooth and the gum.

This is particularly useful in the case of molars. I have cured molars with this treatment that I could not possibly have cured in any other way, because, however expert some other dentists are with instruments, I personally cannot always get all of the tartar from the middle of the crotch of a three- or four-

rooted molar; but I get all that can be reached with conscientious care, and an application of the solvent has given good results that have seemed permanent, so that even if the tartar was not dissolved from under the root, at least the gum was fooled sufficiently into thinking it was not there, and the tooth was perfectly comfortable. I would also state that this solvent has proved most remarkable in the curing of necrotic conditions of the bone where there are chronic fistulas that nothing else seems to be able to heal, especially in those cases where some other dentist has broken off a Gates-Glidden drill in the root-canal of a molar, or where a nerve broach of another dentist has become lodged in the canal so firmly that nothing but the judgment-day can open an avenue between the pulp-chamber and the tip of the root. It is a very great comfort to have a solvent which, when it is injected into the fistula from the outside—I will not say in every case, but in every case I have tried—has caused perfect healing. While I have great hope in the future of this drug as an aid in the treatment of pyorrhea, I think that for the healing of necrotic bony patches in the mouth it is unequaled by anything I have had the pleasure of using. Large abscesses, so large that you could put in your finger-tip, that ordinarily need a great deal of treatment, have with two or three drops of solvent applied three or four times been healed up. It seems to be able to discriminate between the live and the dead bone. It dissolves out the dead cells of the necrotic bone, and stimulates the living cells so that there is complete reorganization of the living tissue.

I recently had also most excellent results with this drug in the use in the bleeding of gums during pregnancy. I guess we all know the symptoms when a pregnant woman comes to us, and we find that the gums are spongy and pithy, and she cannot chew with any comfort. We know how hard it is to treat a case like that, and at the very time she should be able to eat the best she is reduced to a liquid diet. I have had three or four cases where this solvent has had startlingly good results. Only within the last two weeks a patient came to me who was absolutely incapacitated from eating. She takes very good care of her teeth, but in between the teeth there was an inflamed condition of the gums, so that the slightest touch of an instrument caused exquisite pain. Three or four applications of the solvent in the course of a week and a half were made, and I received word from her husband, who is a physician, that she was perfectly comfortable, and he expressed himself as much gratified at the rapid change that had taken place.

I cannot help feeling that while this drug will attack the lumps of tartar, it has the power of attacking the microscopic crystals within the pericemental membrane, and that fact might be one of the reasons why it is valuable in the treatment of the sore gums of pregnancy.

A motion was made and seconded that the meeting extend its thanks to Dr. Head, which was carried by a rising vote.

DIAGNOSIS OF ADENOID GROWTHS IN CHILDREN.

Dr. Crane. The next discussion will be upon the clinic of Dr. E. G. Seibert of Washington, D. C., on "Diagnosis of Adenoid Growths in Children."

Dr. C. A. Hawley, Washington, D. C. The patient whom Dr. Seibert showed presented the characteristic symptoms of adenoid growths, and also the characteristic condition of the dental arches. The fact that dentists have children under their care in many instances where the parents do not recognize those conditions, and where they do not need a physician, the bodily health being apparently good, makes it imperative that the dentist should recognize these conditions. Dentists need not treat these cases, but they will confer a very great favor if they recognize the conditions in the children under their charge and refer them to the rhinologist. It is a fact that nasal diseases and abnormalities have a very great influence upon the dental

arches. In all cases of disturbance of the nasal tract or throat there is a characteristic arrest of development of the nasal and maxillary bones, and also of the dental arch. We recognize those types of dental arches quite easily; in fact, it is possible to diagnose the condition of the nose and throat practically by close observation of the dental arches. I would venture to tell upon seeing a set of models whether a child was affected with nasal or throat disturbances, from the mere type of arch. The diagnosis that was given was very interesting, and is very valuable to any dentist who treats young children.

Dr. W. A. Mills, Baltimore. This is a subject that is very important to dental practitioners, and one in which I have been interested for many years. I believe I might claim the credit of having many years ago first started this agitation, directly among the dental practitioners and indirectly among the medical profession.

I have a good many patients who used to suffer with tonsillitis, adenoids, etc., and before proceeding to regulate their teeth I advised their parents to have these children operated upon. They had not known that anything was wrong with their children's throats, tonsils, or noses. Some of the family physicians said that there was nothing the matter with these children, but I refused to do anything until the operations were performed. The children were then taken to a specialist and operated upon, and the consequence was that after the operation the children not only improved physically, but in many cases mentally and morally. I believe that this is one of the most important parts of our practice today, and very far-reaching in its effects. It is our duty to watch children who come to us at three or four years of age, to recognize any disturbance of the throat and nose, and advise the parents to have a specialist examine them. This should be done in all cases, if the parents expect their children to enjoy good physical and mental health, also in order to prevent any irregularities of the dental arches and teeth.

It often happens that a child inherits a propensity to a weak throat, enlarged tonsils and adenoids often resulting therefrom. The first cause is this: We have here a tonsil which becomes enlarged [illustrating]. This tissue which I show in the illustration on the board is simply what we call the lymphoid tissue left over from embryonic structures. These little follicles and lymphoid tissues of the nose take on a growth the first time the child catches cold, they become congested, and then one cold after another follows, until the growth of tissue becomes so pronounced that the child cannot breathe through the nose, and in consequence adenoids develop. As the dentist is the first to notice these abnormal conditions, I would recommend that when children come to us exhibiting any sign of lymphoid tissue enlargement, they be advised to consult a specialist and have this tissue removed at once, for if it be left alone there will be trouble later in life, when perhaps it will be too late to remedy the evil done.

Dr. H. E. Kelsey, Baltimore. I did not see the clinic, but I would merely like to add to what Dr. Hawley has said, that the studies and daily operations of the dentist should so familiarize him with normal and abnormal conditions of the structures upon which he works as to provide a valuable means of diagnosing abnormal conditions in adjacent structures, considering that many of the most serious malocclusions and malformed arches are the result of abnormal breathing caused by some abnormal condition of the respiratory tract, one of the most common being the presence of adenoids.

Dr. J. P. Corley, Sewanee, Tenn. I would like to say a word on the etiology of what we are pleased to call adenoids. One reason why I am especially anxious to say this is because we as surgeons are prone to cut too much. When we cut normal tissue we leave a cicatrix that remains, to some extent, throughout life. It has a lower status of vitality than normal tissue, and consequently is more susceptible to infection and disease. For

that reason I say that when we can avoid cutting living tissue we should do so.

I appreciate what Dr. Mills has said in regard to the condition, but I believe that the contracted arch is more a cause than a consequence of adenoids. The contraction of the arch is due largely to a lack of functional activity, and this lack of functional activity is the cause of the lack of development of the air-passages. Consequently the air must pass through those passages at a higher rate of speed, causing the cupping of the mucous membranes, eventually hypertrophy, and what we call adenoids is simply an hypertrophied condition of the adenoid tissue, which was normal tissue to begin with. So I believe that if, instead of doing so much cutting, we would correct the irregularities in the dental arch, if we would advise and require functional activity of the jaws and normal breathing, we should be able to correct these conditions without having to cut out so much tissue, and therefore we should not have so frequently a scar and subsequent malformations.

I realize that there are many cases in which cutting is not only justifiable but necessary, but very frequently the condition can be treated in a better way. The importance of an early diagnosis in a condition like this cannot be overestimated, and when we are not competent to cope with the condition and correct it, we should send the patient to a specialist; but I believe that the average surgeon of today, and especially the specialist in surgery, cuts too much. I want to voice this as a note of warning against the man who lays his hands on the temple of the soul, and with his knife trims and cuts and leaves a condition which in the end will render his patient worse than before.

Dr. W. A. Mills, Baltimore. I have studied this subject from all points for a good many years, and I was surprised to hear the previous speaker make the assertion that we do too much cutting of adenoids and removing of enlarged tonsils, and that breathing through the mouth is the cause of this trouble. It is simply the enlargement of the lymphoid tissue, as I have stated before, from constant colds. Suppose, for instance, your nose were filled with cotton to such an extent that you were unable to breathe through the nose, how would you get your breath? You would naturally open your mouth and breathe through it. Here is a child with its nose entirely and its throat partly stopped up. The only opening it has to breathe through is the constricted nares, and what is the consequence? A child having the nose closed, and of necessity being compelled to breathe through the mouth, cannot equalize the pressure of air passing through the nostrils and keep the equilibrium of stress between the nasal cavity and the oral cavity, while at the same time the masseter muscles are pulling downward, the hypoglossus muscles pushing upward, contracting or constricting the jaws, thus not only causing a deformed facial expression, but very irregular arches and teeth. The time has come when we dentists must insist upon having the aid of the surgeon to remove these fungous growths or do it ourselves. They must be removed before it is too late.

Dr. Corley. What makes the child catch cold so often?

Dr. Mills. It is the presence of an abnormal amount of sensitive tissue which is infected upon the slightest change of temperature, such as passing from a warm room to a cold one, or going out into the street improperly clothed, etc. I have had children as patients who looked as if they were nearly starved to death judging by their facial expression. I had the enlarged tonsils and adenoids removed—with the result that instead of being sick and delicate and having the physician call upon them continually, as had been the case, the children gained rapidly in weight and became perfectly healthy—became different children physically and mentally. One-half of the idiots and insane in our institutions today are so as the result of deformed arches, irregular teeth, and noses full of lymphoid tissue. I have seen too much of the ill effects of the indifference shown by both physicians

and parents not to raise my voice in protest. I am in favor of cutting every time, but the cutting must be done judiciously.

Dr. Seibert. My subject did not include a discussion of the effects of adenoid tissue in the naso-pharynx; it was simply the methods of diagnosis. Those who saw the patient this morning were rather fortunate in seeing a child that could hold its mouth open and could so control the soft palate that we might easily have a view of the naso-pharynx by means of the rhinoscopic mirror. That is not always possible with children; as a matter of fact, with ninety per cent. of them, it is next to impossible to get a view of the naso-pharynx with the mirror. To those who did not see the demonstration I might say that the apparatus for diagnosing adenoids consists of a lamp, a head-mirror, a tongue-depressor, and the rhinoscopic mirror. That is all that is necessary. With these instruments one can very readily get a view of the post-nasal space, if the patient is at all tractable. If not, the next method of examination is by the finger—which must of course be cleansed and sterilized with a bichlorid solution—introducing it up back of the soft palate, along the posterior wall of the pharynx into the post-nasal space. Then the finger can be swept around to the sides and roof, and the adenoids be felt as soft, round masses. On withdrawing the finger in such examinations there will invariably be some blood on it, because of the tissue being soft and easily broken down. This bleeding is in itself diagnostic.

I cannot close this discussion without a reference to the remarks of Dr. Corley. He states that after an adenoid operation you have a cicatrix that proves more or less a detriment to the patient in after-life. Such a result would happen only to a careless or incompetent operator. Adenoid vegetations are not made up of mucous membrane; they consist of a growth of lymphoid tissue that is protruding through that membrane. The pathological conditions that follow the presence of adenoids cause thickening of this membrane. If an adenoid operation is performed properly, it may be done without the slightest harm to the mucous membrane. I have never in my experience had one case in which there followed a cicatricial condition of the naso-pharynx, not one, and I have operated on quite a number of cases. That is so because I do not take a sharp instrument and forcibly claw it down and scrape off all the mucous membrane, as is sometimes done by unskilful operators. If the operation be performed in that way, the result would be cicatrization of the surface of the naso-pharynx, which would do incalculable injury to the patient. Not only that, but operators have, in addition, curetted around and cut off the cartilaginous end of the Eustachian tube, and that, in turn, also does incalculable damage by causing sclerosis of the middle ear, with consequent incurable deafness. But such results only happen to those who know not what they are doing. No one is at all excusable for causing such a condition as Dr. Corley claims to result from the operation for adenoids, and its occurrence is in no way an argument for the abandonment of the operation. There is not one man in this hall today who does not believe that we have very many children whose lives are endangered, whose usefulness in life is impaired, because of the fact that they cannot eat properly from lack of approximation of the teeth. That is brought about, as I showed this morning in the patient exhibited, because of the imperfect development of the dental arches.

Dr. Corley made some remarks about the dental arches not developing properly because of lack of function. Certainly because of lack of function, but why? Because the nasal respiration is obstructed, and what is the next thing that happens? The child must have air, and it gets it through the mouth. Just think a moment of what it is that causes the proper development of the dental arch. It is the support of the tongue in the mouth against the lower surface of the superior maxillary bones; that is one of the causes. The tongue has a lateral

thrust that with soft pressure tends to constantly press against the lower surface of the palatal process of the superior maxillary bones and against the alveolar processes. This continually exerted gives a low broad arch, which offers the best possible ground for the proper adjustment of the teeth. If we have that, there will be plenty of room for the teeth. Then there will be a normal dental arch, round and broad.

On the other hand, what sort of a dental arch do we find in a child with adenoids? One in which the alignment of the teeth is more or less straight and sharply angular in direction, a V-shaped arch into which the teeth are crowded. The result, as you saw in the child exhibited this morning, is that the centrals and laterals are crowded and set crooked, and the bicuspids have not had sufficient room to develop properly.

There are other causes for failure of development of the dental arch as a result of adenoids, but I want to impress upon Dr. Corley's attention just that one, the lateral pressure of the tongue on the under surface of the superior maxillary bone.

Dr. Corley. How can you correct that? That is what I am interested in.

Dr. Seibert. Now we come to the point for the dentists. It is unfortunate, as Dr. Mills has so aptly said, that the general medical practitioner is neglectful in the care of these cases and in recognizing the condition, and unfortunately the dentist and the rhinologist do not get these cases until much harm has been done. Children come to you at the age of six or seven with narrow dental arches, or they come to the rhinologist with their noses full of adenoids. At this time the superior maxillary bone is pretty fully developed—not wholly so, but it is fairly developed, and this is the reason why we have an arch of this sort, applying the causes previously given for failure of development. After the adenoid tissue is removed, it is possible for the dentist to step in and correct the difficulty, and those who are practicing orthodontia will fully bear out my statement that within recent years the practice has changed so that many of these cases are corrected entirely. Some are corrected so well that, though the patients persist in mouth-breathing for years, this habit is cured without any special effort on their part, and nasal respiration is re-established spontaneously, we might say. To anyone who is familiar with the difficulty experienced in establishing nasal respiration in these patients this represents an achievement worthy of effort. To my mind it is exceedingly important that the dental profession recognize this fact. I will say, however, that I believe the dental profession is recognizing the necessity for the removal of adenoid tissue much more than the general medical profession. That has come about because of studies of the formation of the dental arches. A recent article in the *Journal of the American Medical Association* makes the statement that it is only within the last five years that we have known what a normal dental arch is, and I believe that is true. Too much stress cannot be laid upon any departure from the normal in the conformation of the dental arch. This is one of the causes, and to my mind the greatest cause, for the failure of development of the superior maxilla, lack of nasal respiration and consequent mouth-breathing, with its train of evils. There are many other symptoms resulting from adenoids that I might touch upon, but I will not take up your time.

Dr. Corley. I wish to know how to make the tongue behave so as to prevent this. I am interested in prevention.

Dr. Seibert. The early removal of abnormal tissue is the secret of success in these cases. I believe that to such an extent that I have had my own boy operated on at the age of a little over one year. The result was that he has had normal nasal respiration, and so far as I am able to judge, his arches are normal; there seems to be plenty of room for the teeth.

Any child is liable to develop adenoid hypertrophy after one or two colds. Dr. Corley asks, "Why do they get colds?" Children take colds because of many fac-

tors—because of carelessness on the part of parents or nurses and themselves. A sudden change in temperature takes place, and the child is chilled. A cold is brought about by the chilling of the surface, causing contraction of the superficial capillaries, throwing the blood into the internal surfaces; the nasal respiratory surface is naturally an extensive one, and would be one point to which the driven blood would go, and its vessels are dilated. A dilated bloodvessel means congestion, the filling up of soft tissues with blood. What is adenoid tissue? It is principally a mass of bloodvessels. Under the influence of chilling of the surface that soft tissue very readily dilates, and that happening again and again causes a greater amount of blood to come to this tissue, causing it to grow larger and larger until there is a mass that fills up the naso-pharynx. That, in brief, is the way in which adenoids develop.

It was moved and seconded that the thanks of the meeting be extended to Dr. Seibert, which was carried by a rising vote.

PROPHYLAXIS.

Dr. CRANE. The next clinic to be discussed is that of Dr. E. C. Blaisdell of Portsmouth, N. H., on "Prophylaxis," and I will ask Dr. Blaisdell to give us a brief *résumé* of what he attempted to accomplish this morning.

Dr. BLAISDELL. The patient whom I presented this morning was not a typical case of pyorrhea, rather one of positive neglect. He claimed that he had brushed his teeth, but he had not. I doubt if they had been in contact with a brush for a number of years, judging from their looks. There was a heavy deposit of calculus at the gingival margin, causing much congestion, with a small exudation of pus about two teeth. The calculus was removed by instrumentation, then all surfaces of the teeth were polished. Tomorrow the patient is to be presented again to show what twenty-four hours have done in keeping the mouth clean. Two teeth were left as found this morning, so as to show the original condition.

IMMEDIATE EXTIRPATION OF THE PULP.

Dr. CRANE. The next clinic is that of Dr. William H. Pearson of Hampton, Va., on "Immediate Extirpation of the Pulp."

Dr. R. O. SADLER, Baltimore. I would like to have the clinician state in his closing remarks whether he uses adrenalin with the cocain.

Dr. PEARSON. I use the preparation put up by Parke, Davis & Co., cocain and adrenalin together.

As to what causes the anesthesia, I have never made any experiments. I am satisfied of one thing, namely, that this mixture will always anesthetize the pulp so as to render the operation painless. I have used cocain alone and found it to be fairly satisfactory, but I prefer the cocain and adrenalin, because this mixture does away with the hemorrhage.

VIBRATORY MASSAGE.

Dr. CRANE. The next discussion will be on the clinic of Dr. W. H. Mitchell of Bayonne, N. J., who had two clinics, "Vibratory Massage" and "Flexible Lower Denture."

Dr. MITCHELL. There has been so much said in the periodical literature that I can add but little to what I said this morning about massage. I have used it, and, like others, know the benefits to be derived from its use. I present a handy way of getting at it with our dental engine. I brought it along, hoping that it would be of some interest and assistance to you.

FLEXIBLE LOWER DENTURE.

The idea of making the lower denture flexible between the bicuspids was suggested to me by a patient, who said "If it would *bend* where it *rocked,* it would not *tilt.*" This plate is made in cases where there is an unequal density in the alveolar ridge. In three practical cases we have succeeded in getting com-

fortable mastication after several ordinary plates had failed.

The principle is the same as is illustrated in a trolley car going around a curve; the four-wheeled car goes around hard, an eight-wheeled car glides around, as it is better adapted to the conditions. If in mastication one part of the ridge is harder than another, with this arrangement the softer portion will depress and leave the other two-thirds of the plate in perfect occlusion and the denture will not tilt.

Dr. CRANE. We will next discuss the clinics by Dr. F. W. Allen, Philadelphia, on "(*a*) Technique of Implantation. (*b*) Use of Dentate Scalers (Kirk). (*c*) The Bing Crown as a Splint for Loose Teeth."

(*a*) TECHNIQUE OF IMPLANTATION.

Dr. ALLEN. The essential feature of this clinic is a swaged gold splint, fitting over the cusps of three or more of the adjacent teeth, for holding the implanted tooth in position. The advantage of this device is that it is absolutely immovable and allows the interproximal spaces to be kept clean. The use of silk or wire ligatures at the necks of the teeth prevents the growth of tissue at those places, inducing also impaction of food débris at those vital points, with the resultant unsanitary conditions. With the swaged cap covering about half of the crown surface of the teeth, and with the occluding surfaces of the splint articulating properly with the lower teeth, the teeth are held rigidly in position, and satisfactory results are assured.

Another factor in the implantation of teeth is the over-sterilization of the tooth to be implanted. There have been repeated instances where teeth have been over-sterilized in a bichlorid or other solution of equal strength, which has resulted in a loss of the vitality of the pericemental membrane, which should be carefully avoided in cases of implantation. The pericementum of the tooth, of course, must be intact, and not be mutilated when we implant the tooth. These two essential features are requisite to the permanence of an implantation operation. When this operation is properly performed, the teeth last from six to ten years, when absorption of the roots takes place, and the tooth is lost. A second operation, however, can be performed, and the tooth can be saved for another period of time, though a second operation is much more difficult than the first on account of the increased density of the alveolar process.

(*b*) USE OF DENTATE SCALERS (KIRK).

In the second clinic I explained the use of the Kirk "dentate scalers." The real force of these instruments is simply the principle of the cabinet-maker's plane, presenting acute-angle surfaces in contradistinction to the flat cutting surfaces of the ordinary chisel. These instruments are most efficacious in breaking up hard deposits on the teeth, facilitating their thorough removal by the use of the ordinary scalers. For the purpose of cleaning and polishing teeth I know a number of most distinguished practitioners throughout the country who confine their efforts to the use of pumice. This is wrong, because the surfaces of the teeth, after continuous use of pumice, microscopically present a number of little fine lines caused by the abrasive action of the pumice material, whereas, if we use chalk or tin oxid for this purpose, we can leave the surfaces of the teeth as resplendent as gems, and render the cleansing process more effective and permanent.

(*c*) THE BING CROWN AS A SPLINT FOR LOOSE TEETH.

The use of the Bing crown, which I demonstrated, is to fill the space caused by a missing tooth. This is not a substitute for crown or bridge work, but simply a remedial procedure. The Bing crown has platinum ribs or pins running through it and extending on either side. These pins are quite hard and two or three times the diameter of the ordinary platinum pins, and by anchoring them

in the adjacent tooth and cementing them to place or setting them in amalgam, you have a tooth that will remain in position as long as the anchorage tooth remains. Excellent results have been obtained by the use of this crown, which is in many cases a happy alternative for bridge work. It is a simple operation and readily permits of a hygienic condition around the teeth.

ORTHODONTIA SIMPLIFIED.

Dr. CRANE. The next clinic is that of Dr. R. L. Simpson, Richmond, Va., viz, "Orthodontia Simplified."

Dr. H. E. KELSEY, Baltimore, Md. I know more of Dr. Simpson's extreme ingenuity and ability in carrying out his ingenious ideas than I do about this particular clinic. He seemed to have some very efficient little adjuncts to the expansion arch, and I have no doubt that he accomplishes rather rapid and successful movements of individual teeth with the little springs that he attaches to the expansion arch, and also larger and more complete movements of the whole number of teeth in the arch. I imagine that he obtains fairly good results, although in some cases he has not as much anchorage from which to work as I should desire myself. I can certainly commend the beautiful and skilful manner in which the clinician constructs these ingenious appliances which he has added to the expansion arch.

Dr. HAWLEY. I want to commend this ingenious little appliance very much, but would criticize the title of the clinic as being a little too ambitious. If the clinician would tell us how his simplified orthodontia would apply to two or three cases, how he would meet certain situations, as the tipping of the roots of molars, I would indorse that title.

Dr. SIMPSON (closing the discussion). Before I make any reply to the discussion, I would like to state that Dr. Hawley's criticism is absolutely just. The title of my clinic is entirely presumptuous. It was put down in haste, and to be accurate should be: "Orthodontia to Some Extent Made Positive."

The great defect of Jackson's system is that the appliances so often will not stay in place, and patients will also take them off. The strings and wires of Angle's system are so troublesome to some of us that we have been tempted to call them infernal. I have tried to devise something that would be more stable and more positive in its action than anything I have yet seen. In just a few words the system is this:

Clamp bands of any make, or pinch bands with tubes for an arch bar are applied to the first molars usually, but in some cases to the second bicuspids instead. For the teeth to be moved pinch bands are made, having perpendicular tubes of 21-gage caliber, soldered to the labial surfaces. If the tooth is to be moved forward, the tube is soldered to the middle of the band; if it is to be rotated, the tube is soldered to whatever side is to be brought forward, etc. Springs of 21-gage German silver are so bent as to rest on the arch bar and at the same time fit into the small tubes. In many instances the arch bar is not necessary. This system will move teeth forward or rotate them, move the roots mesially, distally, or labially, will move distally one or both molars as you elect, does away with those troublesome nuts and screws on the arch bar and acts as an excellent retainer. These springs stay on, and are constant, uniform, and positive; they have made orthodontia a pleasure to me.

Perhaps Dr. Kelsey and Dr. Hawley think that I do not carry these cases to completion. I have done so, and in the greater number of cases the parents and patients are willing to stop long before I am satisfied. The system is so positive that it encourages the completion of cases.

It is worth your trying, and I believe you will find it more positive than anything you have used before.

ADVANTAGES OF THE SNOW BOW IN PLATE WORK.

Dr. CRANE. The next clinic is that of Dr. E. E. Belford of Cleveland, Ohio,

on "Advantages of the Snow Bow in Plate Work."

Dr. Belford. I showed in my clinic the Snow face-bow in connection with the Twentieth Century articulator, with models and charts illustrating their use. The face-bow has nothing to do with taking the bite in the ordinary sense, as that is done in the usual manner, but after the bite is obtained the face-bow is designed to preserve the relationship of the jaws in mounting the casts in the articulator. With the Twentieth Century articulator one can also get the condyle path, which is a very great help in occluding the teeth so as to obtain three-point contact. The articulator and face-bow are the invention of Dr. Geo. B. Snow of Buffalo.

A FEW THINGS, NEW, OLD, AND POSSIBLY INTERESTING.

Dr. Crane. The next clinic is that given by Dr. H. E. Friesell of Pittsburg, Pa., on "A Few Things, New, Old, and Possibly Interesting."

Dr. Friesell. I showed in my clinic a few things that I thought might be interesting as demonstrating certain principles in operative dentistry, and also two articles that promised to be of particular interest here in Washington on account of the Taggart-Boynton lawsuit.

AN ORIGINAL CASTING DEVICE OF THE IGOROTS.

I have a friend who spent three years in the Philippine Islands, and in conversation with him I learned some of the things that are peculiar, apparently, to that part of the world. Among them was the fact that the Igorots have a method of casting metal appliances that they desire to make in certain forms, and this last summer when I was on the Pacific coast, at Seattle, I found that the Igorots in their village were making brass pipes, casting the bowls of the pipes, using wax as a disappearing model, investing it in a clay investment apparently, burning it out, and melting whatever metal they chose with a very unique and original blowpipe apparatus, which resembled very much two long tubes worked by two sticks with feather dusters on the ends. With this apparatus they were able to generate sufficient heat to melt brass or bronze composition, and cast their metal appliances.

A GNATHO-DYNAMOMETER.

I have also shown an instrument called a gnatho-dynamometer, which is an instrument for measuring the strength or the force of the bite. We dentists do not take sufficient interest in the condition of the dental apparatus from the standpoint of usefulness. If a tooth is not used or cannot be used vigorously in mastication, the patient is not properly masticating his food or using his teeth. The ability to use one's teeth vigorously in mastication depends very largely upon the condition of the pericemental membrane, and nothing will demonstrate that condition more quickly than a testing apparatus of this kind. The average patient in biting, as has been proved by investigations, will exert an energy of from 75 to 125 pounds on the incisors and from 100 to 300 pounds on the bicuspids and the molars. Yet many patients present who have been in the habit of living on a mush-and-milk diet, who cannot exert a bite stronger than twenty-five to thirty pounds on their incisors, and twice that amount on their bicuspids and molars, without producing pain in the pericemental membrane.

IDEAL CONTACT POINT.

I also showed an enlarged model of four teeth in the alveolar process, made to a scale of fifteen diameters, from a skull in my collection. This model shows the ideal contact point, both as to its location and form; the ideal interproximal gum septum as it will be preserved by proper contact points, the proper dimensions and proportionate size of the interproximate spaces, and the location of the normal gum line, the gingival line, the gingival margin, and the gum margin, four things that are very much

confused in dental literature, all of those terms being at times improperly applied to indicate each one of these four different places.

REPLACING BROKEN FACINGS IN THE MOUTH.

Dr. CRANE. The next clinic is that of Dr. J. P. Corley of Sewanee, Tenn., on "Replacing Broken Facings in the Mouth."

Dr. CORLEY. It becomes necessary to replace facings from three principal causes. The first, of course, is fractures and breakings; the second, we might say the most frequent, is shrinkage or contraction of the gums from recently extracted roots, leaving the facings too short; the third is "off color." When it becomes necessary to replace a facing there are three important features to consider. The first is permanence and efficiency; the second is the esthetic result, and the third is the shortness of time and the economy of the operation.

The method which I used this morning was a very simple one. [Drawing a diagram on the blackboard:] This represents a cross section of the bridge or of the backing of the Richmond crown, or whatever it may be. The platinum pins, of course, are left in this if the facing is broken off accidentally or if you chip it off yourself. The first step in the process is the selection of a proper facing; then cut off the pins and strike this backing off, making it perfectly smooth, and grind up the gingival end of the facing until it fits. Warm a small piece of wax, stick it on the backing, and press the facing home. The facing has in the back a little slot, the bottom of which has the shape of a tube. In slipping it off, an impression of the slot is left in the wax. With a small drill, drill a hole right through the backing at a point almost at the top of the little wax ridge; then drill another hole a little farther down and entirely through it. These holes are tapped. Then a little gold screw is set in each of these holes, and the facing is slipped home to see that it fits properly. It is then removed, the screws are taken out, and reseated with cement. The facing is covered with soft cement and slipped home. This little screw has a head which fits the beveled slot in the porcelain tube. If we have considerable absorption of the gum, which would leave the gum line much lower at this point than on the approximal sides, simply bake porcelain gum body on its gingival end and bring it up on the same gum line with the other teeth. This process requires only from ten to fifteen minutes, and gives an equally strong result, in my opinion, as the soldered facing. One of the most important features in connection with this method is the hygienic effect obtained. It is almost impossible to back up a platinum-pin tooth in such a way that the secretions will not get in. The gold backing may fit absolutely when it is swaged up, but when the solder is flowed over it, the contraction which occurs in the baser metal warps the backing. I have never taken off a facing which had been worn in the mouth for a month that had no accretions under it. With this style of facing there is no space at all, unless the cement should wash out. The facing is such a close fit that there is no more danger of the cement washing out than we have under an inlay; therefore there is no place for secretions to accumulate and it is hygienic. If it should be broken or fractured by a blow, it can easily be replaced. The facing is left just a little bit short, if the bridge backing will allow it, so that there is a little margin of gold protecting the margin of the facing, and the stress of mastication and bite falls on this little margin, instead of falling on the facing.

SILEX AS A SEPARATOR.

Dr. CRANE. We will now hear from Dr. J. E. Nyce of Philadelphia, Pa., who gave a clinic on "Silex as a Separator."

Dr. NYCE. I mix the plain liquid silex sold at dental depots in a pint milk-bottle, using about one part of silex to about six parts of water; in other

words, put about half an inch of liquid silex in the bottle first, then fill it up with boiling-hot water. Let this hot water strike the silex from a distance of about two feet, then thoroughly cool the mixture, when it is ready for the coating of the impression. It gives a thin, watery solution, suitable for separating very easily. In the majority of separating fluids there are coloring materials which fill up all the sharp margins and rugæ, which latter are very necessary in a correct model of the impression taken from the mouth. There is no coloring in this, and none is necessary after the operator once becomes used to it. The silex can be coated on the impression immediately following its removal from the mouth. If an impression has been laid aside and has become dried out, it is simply placed in cold water for several minutes, after which it is coated with the silex. It is not necessary to wait until this dries. If the impression is removed in very many pieces, these can be waxed together and another model run in the same impression.

(Saturday Afternoon.)

TAKING PLASTER IMPRESSIONS OF PARTIAL CASES.

Dr. CRANE. The next clinic is that by Dr. J. H. McClenahan, Washington, on "Taking Plaster Impressions of Partial Cases."

Dr. MCCLENAHAN. The clinic demonstrated the taking of a plaster impression as suggested by Dr. Angle. I select a tray that is a little large for the case, *i.e.* about a quarter of an inch outside the buccal surfaces of the molars, in order to have a wide fracture surface. I oil the tray with olive oil, so that it may come out and leave the plaster in the mouth; remove the plaster, when it has set very hard, by putting the right forefinger up under the cheek, the inside of the finger uppermost, then the palmar surface of the finger on the top of the plate rim and rotating downward and inward, thus pressing the plates downward and outward. For the right side, the forefinger of the left hand is used in a similar manner. The fingers should be thoroughly dried. I usually get an impression out in four pieces—two sides and the front and palatal pieces. I do not put my impression in the tray again, because I believe that the accuracy with which you put it together would suffer therefrom. I put the fragments together outside. If the plate seems to adhere to the mucous membrane, a syringe of water injected along the edge of the plate almost always breaks up this adhesion. I use Hisey model cement for sticking the pieces together.

PRACTICAL PORCELAIN FILLINGS.

Dr. CRANE. The next discussion is on the clinic of Dr. A. L. Miller of Takoma Park, D. C., on "Practical Porcelain Fillings."

Dr. MILLER. I selected DeTrey's porcelain, not for any particular inherent advantage over the other porcelains, but because it can be fused without the electric furnace. It is stated in the directions of DeTrey that a Bunsen burner should not be used with the porcelain. That I find is not absolutely true. I use the Bunsen burner, I can hardly say invariably, but in a majority of cases. The manufacturer's principal reason, I suppose, is the fact that the color would be easily burned out at the temperature of the Bunsen burner. In the alcohol lamp the porcelain can be fused, but the color cannot be burned out. The filling is made in the same way as all porcelain inlays, the impression being taken either in platinum or gold foil; platinum is usually preferable. The colors seem to stand well, some fillings that I have inserted three or four years ago having lasted well, apparently without any change in color.

The edges have to be prepared in the same way as in all porcelain inlays to be able to withstand pressure or the possibility of chipping. I know of no other advantage in the use of the DeTrey's porcelain than the fact that it can be used by men who cannot secure electri-

city. I chose it at first on acount of my being unable to secure electric connection in one of my offices, and because it was not practicable to carry the impression from one office to the other, there being too much danger of distortion.

PORCELAIN WORK.

Dr. CRANE. We will next hear from Dr. A. S. Wolfe, Washington, D. C., whose clinic was on "Porcelain Work."

Dr. WOLFE. I endeavor to make the whole crown in one baking, but I have never succeeded, always having to bake it twice. In pouring plaster and silex for the investment of inlays, the tooth can be broken out of the investment, built up, and reset in the plaster to see just about how much there is to be added or taken off.

About six years ago I tried one of Dr. Capon's crowns, and I had success when the bite was on the platinum, but when the bite was on the porcelain facing I did not feel that I had sufficient strength in the porcelain alone to keep it intact. I think the full porcelain jacket crown without any metal is best adapted for use in the mouth of a lady patient. The platinum is certain to darken the tooth; you are bound to get that bluish light through it, but not strength; that is, I am not skilful enough to obtain sufficient strength to make the porcelain adhere to the platinum. The little thin stratum of porcelain that is put between the porcelain facing and the platinum backing is not sufficient to withstand the bite, especially if there is any hitting on the porcelain. If the stress is on the platinum it is all right, and I am thoroughly convinced that the full porcelain jacket crown will stand all the stress that is necessary. It is very much more cleanly than the platinum crown, and especially I have been able to obtain just as good margins with the porcelain as with the platinum.

PORCELAIN WORK.

Dr. CRANE. The next clinic is that by Dr. W. A. Capon, Philadelphia, on "Porcelain Work."

Dr. CAPON. As far as the description of this work is concerned, it would take probably an hour or so, at least, to give any adequate idea that would be of any use to the listeners. Therefore I will say a few words in regard to the amount of porcelain used in the first fusing. The veneer is placed on the metal and held by sticky porcelain, and no building-up or carving can be done without the likelihood of moving that veneer. It is therefore first attached; then the extent of shrinkage can be watched, and the piece finished in the second fusing, adding or cutting as necessary. Therefore it is an advantage to fuse the piece a second time. There is no disadvantage, because if the veneers are cut on the exterior surface as well as the interior surface, the glossing is reproduced by the higher heat of the second fusing. This explains why a crown is not fused to a finish at one time.

The comparative value of the two crowns depends, I think, entirely on the individual. In reference to the translucency or the opaqueness of the one as compared with that of the other, I admit that in all such cases the all-porcelain crown may have some advantage, but in my estimation it is outdone by superior advantages in the other.

The veneer that I use is made especially for the purpose, very thin, thus saving any extensive cutting of the natural crown. The advantage of this work over the all-porcelain, in the majority of cases, is that it has absolutely no limitations, if the root is not diseased. These crowns are made for an end-to-end bite, or any other way in which they can be placed. There is nothing to hinder one from access to the pulp of the tooth, if it should die, which occasionally occurs. No crown was ever devised that is absolutely infallible, and what we want is something that, if it is well made, will do the work expected of it. If this crown breaks it can be repaired without any injury to the foundation, and when completed is a pleasure to the eye. In the majority of cases there is nothing superior to the crown with the platinum base, if properly made.

The question in regard to the porcelain attaching itself to the platinum was suggested. That is a troublesome matter, unless placed right. There is a mechanical adaptation that is not seen; there are little irregularities in the platinum which give it splendid attachment. Independent of that, a porcelain must be used that has a superior tendency to adhesiveness to platinum. My porcelain, which I am glad to show to you, has this quality. The causes thereof I cannot tell, except that I discovered a fortunate combination. I have old overfused crowns that have defied the picking and the tests of hundreds of dentists in trying to peel the porcelain from the platinum. This is an important feature in this class of work. As I said before, there is no case that cannot be repaired in a short time if no injury has been done to the foundation. Moreover, this work is done in the mouth, the adjoining teeth aiding in the selection of shade and position. This repair can be done at one sitting, or, if the operator is not well enough advanced in the work, two sittings can be made of it. Experience will soon impart to the operator a good deal of confidence and possibly speed. In my hands this work has been successful. Occasionally we can use a variety of crowns to advantage. The all-porcelain crown, with the dowel pin, has its advantages under certain circumstances. The tube crown, the cup crown, the all-porcelain hollow crown, or the lap crown, which I think is superior because the lingual surface of the tooth is not covered by either platinum or porcelain, have their disadvantages. The foundation for an all-porcelain jacket crown must be of a certain kind to insure the greatest success.

I have yet to find a case in which this crown, made of platinum and porcelain, cannot be applied, if the foundation is at all suitable. If the foundation is absolutely unfit for any kind of a pin crown, a jacket crown can be made. In my own mouth I have worn a crown for sixteen years, and I have made others which have lasted as long. I have possibly made over a thousand or fifteen hundred such crowns, frequently placing from six to ten in one mouth, that have already lasted many years, I am just as enthusiastic over this class of work now as I was ten or fifteen years ago, because I have chances of seeing this crown after that length of time under all conditions. It would be very impossible to continue a practice, either of inlay or porcelain work, if patients were announcing every hour, or even every day, that the work was not durable. Therefore accept my enthusiasm as being born of hard constant work covering a period of nearly twenty years.

EXTRACTING WITH THE CRANE EXTIRPATOR.

The next clinic discussed was that of Dr. J. T. Vivian, Washington, D. C., on "Extracting with the Crane Extirpator," which was described by Dr. Crane.

Dr. CRANE. The clinic that Dr. Vivian gave this morning is one that shows an entirely new principle in the extraction of teeth, as far as I am aware. It is a discovery of my own, made quite by accident. I was endeavoring to get out a root of a tooth which had broken off in extracting. The root was in such a position that I could not get hold of it with the forceps, and the bone was so hard that I could not force an elevator down. I took my ordinary cotton pliers and endeavored to work them down between the process and the root, hoping to insert the point of the pliers underneath the apex of the root, then turn them, and in that way loosen the root. As I worked them down, using the instrument with the same motion that a shoemaker uses in forcing his awl through leather, that is, a semi-rotary motion of the wrist, I was very much surprised to see the root ride up out of its socket, and it immediately occurred to me that I had stumbled upon the application of an old principle in physics, that is, to drive out one wedge by driving in another. The tooth-root is a wedge, and the point of this instrument is a wedge, and as one wedge is driven down

in the socket, the other wedge has to come out. I therefore had an instrument made with a broader handle, and with about the same point as the cotton pliers, and started to use it in the manner described for taking out roots. As I extract a great many of these, I was very much pleased to find that I was successful in every case. I called Dr. Vivian's attention to it one day, as he is visiting dentist to one of our institutions and has a great deal of extracting to do; he is a young man who was graduated from college a few years ago, and has had very little experience in extracting. He was having great difficulty with roots, and I gave him one of these instruments, and he extracted twenty-seven roots with it without one failure. This corroborative evidence prompted me to have some of these instruments made, so that other dentists, who had been having trouble with root extractions, could try them.

A method also occurred to me of extracting lower third molars in which the crowns come over against or under the crown of the second molar. Those cases are frequent and very difficult. The third molar lies too tightly against the second molar to permit the insertion of any elevator, and as a general rule the roots of the lower third molar are curved upward and back, so that it is rather hard on the patient to extract those teeth with the forceps, because frequently a large portion of the transverse plate is carried away. By putting the point of this extirpator in the interproximal space from the buccal side, carrying it through between the teeth toward the tongue with the point upward until the point is completely through and the angle reaches against the middle of the mesial surface of the third molar, and then by turning it forward the beak and shank of the instrument hug around the second molar, and the angle makes ever so little a wedge against the crown of the inside tooth, and by a slight pumping motion, which may have to be kept up for some time, the third molar is gradually loosened upward and backward, so that it can be lifted out without injury to the process.

This instrument proved to be very useful also in connection with a badly broken molar or one decayed below the bifurcation of the roots. It is very difficult to extract such a tooth with forceps. I start the point of the extirpator between the process and the root and carry it down until it strikes the bifurcation, then turn it and force it in, using a semi-rotary motion. The force of the wedge going between the two roots forces them apart, and then it is a simple matter to remove them as you would single roots.

Since I have been using this instrument, I have never used an elevator in my practice. It is so simple that any dentist who can temper steel can make one himself. I do not wish to boom its sale.

STRENGTHENING A ROOT FOR A DAVIS CROWN.

Dr. CRANE. The next subject for discussion is Dr. Rice's clinic on "Strengthening a Root for a Davis Crown."

Dr. J. T. RICE, Washington, D. C. It is my idea to make little grooves in the back of a root to strengthen it and prevent the rotary strain in twisting. The root is trimmed in front up to the free margin of the gum. In the back it is left extending approximately one-sixteenth of an inch above the gum. That leaves a little plate of enamel sticking out, in which, of course, there is no strength, and it also leaves an undercut. With an enamel cleaver or sharp scaler this enamel plate can be easily removed, and then with a No. 3 round bur I go up about midway on each side of the lingual part of the root, and the tooth is prepared for casting the abutment. The wax is merely placed over the end of the crown, the pin is heated in the alcohol flame, placed into the wax, and then the wax is softened and pushed up on the teeth, carved, and removed, when the casting is finished and cemented.

DENTAL BOOKKEEPING.

Dr. CRANE. Dr. Mess gave a clinic on dental bookkeeping, and we will now hear from him.

Dr. C. J. Mess, Washington, D. C. Any entry should be made while the patient is still in the chair; then one does not have to do it after the office hours are over. That is one of the main points that I wished to emphasize in my clinic. This method is simply a modern method of loose-leaf ledger, instead of the old method of bookkeeping. The loose-leaf ledger combines the advantages of the card system with those of the book, and is used just like a book. I had the chart made to suit my own convenience; it is printed in light-colored ink, so that my entries of fillings could show up clearly.

DENTAL INSTRUMENT-MAKING.

Dr. Crane. The next discussion is of the clinic of Dr. J. A. Watling of Washington, D. C., on "Dental Instrument-Making."

Dr. Watling. It would be a great pleasure to me to know if I have assisted anyone in perfecting dental instruments. I have been the unfortunate designer of a number of instruments, and have been greatly annoyed by the instrument-maker himself. Several years ago I had difficulty in filling an upper second molar with gold. The tooth was hardly developed, very short, and as I had no clamp that would stay on such an irregular tooth while the patient was in the chair, I made a clamp which I have used ever since. It will stay without tipping where no other will hold. These clamps were made and put on the market. At first they were very satisfactory, but I have found out lately that they are not doing the work they ought to do, because the manufacturer was not following the original pattern. I saw the S. S. W. Co.'s representative here, and he said that he would look into the matter. But if dentists fail to make instruments, who is going to make them? We cannot depend upon instrument-makers to devise new instruments or even to carry out the patterns of the originators. We must rely upon the dentists themselves to make the patterns, and then see that the instrument-makers follow those patterns. It is a mistaken idea that the dentist can sit back and pay no attention to his instruments, and depend entirely on the instrument-maker. Take, for instance, the excavators as they are made today. Many of them are absolutely worthless. They should be immediately returned to the manufacturer or to somebody who can put a blade upon them. Take the hatchet excavators as they come to us from the manufacturer; they are short, blunt-pointed and thick in the blade, whereas they should be thin as a knife blade, so that they will cut. An excavator should always be kept sharp.

I simply wish to call attention to the fact that the dentists are to blame if they do not have proper instruments.

REINFORCING THE LINGUAL CUSP IN PORCELAIN CROWNS ON BICUSPIDS AND MOLARS.

Dr. Crane. The next clinic to be discussed will be that of Dr. E. E. Cruzen, Baltimore, on "Reinforcing the Lingual Cusp in Porcelain Crowns on Bicuspids and Molars."

Dr. Cruzen. For a good many years I have been making porcelain crowns for bicuspids and molars, and I used to experience trouble with the splitting-off of the lingual cusp. In making these crowns formerly, I used a pin for each cusp. Finding that the lingual cusp would split off, I obviated that by making a band to support it. This band extends up on the lingual surface about three-quarters of its length. The procedure may be described in a few words: After the root is prepared, a piece of platinum plate is cut to approximately fit, and allowed to slightly extend lingually. The post is soldered to place, and the plate is burnished to the root, outlining the margin, removed and trimmed to the margin on the buccal side. The portion extending lingually is clipped in several places toward the post, replaced on the root and burnished over, so as to form a half-band to encircle the lingual surface of the root. It is then removed and the joints are soldered with 24-k. gold, and replaced. The bite and impression are

taken and the balance of the work is completed on a model. The band to support the cusp is adjusted and soldered with 24-k. gold, making a cup-shaped foundation to support the lingual cusp. A porcelain facing may be soldered to the post for the buccal surface of the crown, and the lingual cusp be built up with porcelain body, or else the whole crown may be built up of porcelain.

With this support of the lingual cusp I have had practically no failures in about six years.

REPLACING BROKEN FACINGS.

Dr. CRANE. We will next discuss the clinic of Dr. J. P. Corley, Sewanee, Tenn., on "Replacing Broken Facings."

Dr. CORLEY. My clinic was intended to show the use of the Steele interchangeable facing for crown and bridge work, and especially the new saddle-back, which is not on the market yet, but will be in a few months. I cannot go into a discussion of details, because it would take too long. I suppose most of you are familiar with it, anyway. I shall simply note a few of the special advantages which are to be derived from this facing.

In the first place, in bridge work, when a root has been recently extracted, it is impossible to put a facing on which will fit each case after absorption shall have taken place. Therefore I select a facing which fits the case comfortably, and after six months or a year, or as long as I wish to wait, when the absorption has been completed I take that facing off and slip on a longer one. In anterior teeth, of course, that would be unsightly, but that rule holds good with the soldered facings as well. To obviate this unsightliness I bake gum body on the gingival end of the root. Whites' No. 92 special is the most desirable porcelain body that I have found for this work. Only a few minutes are required to bake this pink on the facing, and any shade of pink desired can be obtained by blending other colors. Another unique advantage is that the porcelain does not have to go through the fire, and is therefore never checked. The porcelain backing, in my opinion, seldom breaks unless it has been checked in the fire. If Steele interchangeable facing breaks, it requires only ten or fifteen minutes to replace it. We obtain them in duplicate, giving the extra one to the patient, and if the patient breaks one, he can go to any dentist and have it replaced in a few minutes.

Another very decided advantage of this facing is the temporary use that can be made of it. When a tooth is cut off and the root is prepared for the crown, the patient does not wish to leave without his tooth. Therefore a pin of the proper length is cut from a piece of nickel-silver wire, German silver wire, steel wire, or any kind of stiff wire, temporary stopping is put on that, and the duplicate facing is set in the slot in the facing and in the canal of the root, which can be done in five minutes. The patient can wear this temporary facing for a month if necessary, giving the operator plenty of time to finish the permanent work. The temporary bridge is made in the same way, except that a smaller wire is selected. A piece of German silver plate is lapped around it, inserted in the slot in the facing, straightened out, and adapted to the facing. Then it is slipped out and soldered with silver solder, and a cheap and easily made backing is obtained. If post abutments are used, a staple of nickel silver and wire extending from one abutment to the other can be made, to which the backings can be soldered. The facings are set on with temporary stopping, with which also the bridge is set. In this way a temporary bridge is obtained that the patient can wear for weeks or months. This bridge can be made in half an hour at the most.

I also showed a cast pin on the back. Dr. Rice, I believe, had something very similar. There is very little difference between his method and mine, except that I did not have the irregularities on the end of the root. I believe that to be of advantage, and shall adopt that method. The impression of the canal is obtained in the following manner: A

piece of inlay wax is rolled like a gutta-percha cone for filling root-canals, the root is wetted or slightly oiled, and the wax cone forced into the canal. Then a little piece of 22-k. gold plate is cut a little longer than the canal, twisted around once or twice by grasping each end with a pair of hemostats, making it in the shape of a screw. Warm this and introduce it into the wax in the canal. The wax sticks to the pin as it is withdrawn, and a perfect impression is upon it. If a Steele facing is used, the facing and backing are ground to fit, and the gold pin is set into the canal. Some sticky-wax is put on the backing, and the facing and backing are set up as desired. Then the entire core is lifted out, the facing is slipped off, the pin and backing are grasped with soldering pliers, and tacked together. The canal is then filled with warm wax, the crown joined and set up with inlay wax, lifted out, the facing slipped off, and the case invested, cast, and finally polished and set.

SOME USES OF THE HEMOSTAT IN DENTISTRY.

I have recently been using hemostatic forceps for work in the mouth. Their most useful application is in dissecting the gums off the third molars, which has been a very difficult procedure for me. We usually have a flap of the gum hanging over the cusps of these teeth. It is a very simple matter to grasp that flap with a pair of hemostatic forceps and then to dissect it all the way around and lift it out easily. The flap can be grasped on either side with the little "mosquito" hemostats. The patient can hold them on one side while you dissect on the other.

Also, the passing of sandpaper strips between the posterior teeth with ordinary pliers is usually found to be troublesome. This can be done with a pair of curved hemostats much better, especially after the point of the strips has been passed through the interdental space. With these very delicate hemostats it can be grasped without turning it loose, pulled through the interdental space, rolled around and around, and used in polishing the tooth surfaces. The hemostats can also be used in the same way with floss silk for holding strips of rubber dam while polishing soft amalgam approximal fillings.

JACKSON REGULATING APPLIANCES.

Dr. CRANE. We will next take up the discussion of the clinics on orthodontia, and I will call on Dr. Finley first to give a review of his clinic.

Dr. M. F. FINLEY, Washington, D. C. I demonstrated my use of the Jackson principle of making appliances for regulating, my idea being that a removable appliance is better for the purposes of cleanliness in the mouth and is at the same time effective. I have also made a special adaptation of the rubber plate with the ridge to correct the anterior protrusion of the upper jaw with a retrusion of the lower one. Ordinarily, we call this "jumping the bite." I had one case shown today that has been exhibited several times, in which the correction was made in four months, consisting in an absolute change of the shape of the angle of the jaw to conform to the new position.

ABSENCE OF FOUR FIRST BICUSPIDS.

I also showed two models, the upper and lower jaw of a case illustrating conditions which, as far as I am able to determine, have never been shown before. These were models of a case of a patient eleven years old in which the first deciduous molars were all absent from the mouth. There were also no first bicuspids, and no indication of their eruption. The permanent canines and incisors were in place. No X-ray photographs were taken, as the child's father, a physician, did not deem it advisable. The patient has been delicate so long that the father hesitates to do much of anything. I have talked with several *confrères* after exhibiting these models, and they have invariably stated that they never had seen a case where the four

first bicuspids were absent. One first bicuspid or the four second bicuspids might be absent, but never the four first bicuspids. This I consider of more importance, perhaps, in today's demonstration than anything else, as the other items have been shown before from time to time.

AUXILIARY ARCH FOR ROOT MOVEMENT.

Dr. C. A. Hawley, Washington, D. C. Of several appliances I first showed a small auxiliary arch for root movement, first suggested to me by Dr. Peete of Memphis. It is slipped on, above the regular arch, just forward of the molars and passes along the necks of the incisors, while the regular arch is bent downward toward the incisal edges. By turning the nuts in front of the short tubes, the roots of the teeth are carried out, while the resultant of the force presses back the lower part of the tooth. It can be slipped on at any stage of the treatment, and is simpler and more effective than any other device for this purpose that I have seen.

SPLIT BUCCAL TUBE FOR KEEPING MOLARS FROM TIPPING.

I also showed on a model the application of the split buccal tube for keeping molars from tipping. Instead of

Fig. 1.



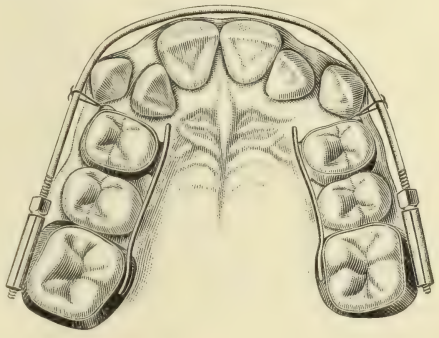
the regular smooth tube which, as the molar passes outward, allows the arch to turn and tips the buccal cusps upward, this device compels the tooth to move bodily through the process. It first came into use as a stationary anchorage on one side while the molar on the other side was being moved out, for a tooth offers more resistance to the bodily moving of the roots than it does to tipping. Instead of a solid tube, a split tube is used, and on the arch, where it passes through it, a piece of metal or a wire is soldered. This keeps the arch from turning, and the tooth must move bodily without tipping, which is of great advantage in many cases. (Fig. 1.)

The principle was first suggested by Dr. Kemple of New York.

DEVICE FOR OBVIATING LIGATION OF BICUSPIDS.

I also demonstrated on the same model my own device for preventing the necessity of ligating the bicuspids and adding stability to the appliance. It consists of a small wire soldered to

Fig. 2.



the mesio-lingual angle of the molar bands, and passing along the lingual side of the bicuspids; it is attached to the first bicuspid or canine by a small wire attached to the band on that tooth and turned upward over the lingual wire. On the outside of the first bicuspid or canine is soldered a small eyelet, through which the arch is ligated. In this way we have only one ligature on that side, and none passing between the teeth and thereby causing irritation. (Fig. 2.)

CHARTS FOR DETERMINING THE ARCH AND MEASURING INSTRUMENT.

I also showed the use of my charts for the predetermination of the arch and my instrument for measuring teeth. By measuring the width of the central in-

cisor or, if they have erupted, the centrals, laterals, and canines, we may select a chart which will show the width of the arch, its length, and the position in which every tooth should be placed. They are based on accurate measurements of the teeth, and cover in their range the smallest and the largest that are found in the mouth, both upper and lower.

CONSTRUCTION OF THE JACKSON CRIB.

Dr. C. L. CONSTANTINI, Washington, D. C. The main point I wanted to bring out was anchorage. I have seen many failures of the application or the adaptation of the Jackson crib due to the following feature: The cage is made like this [illustrating], generally speaking. It simply hugs the neck of the molar, and depends upon that retention alone. The use of the interdental space with this cage is Jackson's own idea. Instead of the wire hugging the neck of the molar, my wire does not touch it within one thirty-second of an inch, but the points of contact are within the interdental space. Instead of having the wire touch the tooth at this point, *i.e.* at the buccal surface, the reverse is the case; it does not touch the buccal surface at all. The best part of the retention of the Jackson crib is at that point in the interdental space, and this is obtained by cutting out a little of the tooth on either side and fitting in this wire hook, so to speak.

Dr. CRANE. On the model?

Dr. CONSTANTINI. Yes, on the model.

Dr. CRANE. You do not touch the tooth in the mouth?

Dr. CONSTANTINI. Oh no! I do not touch the tooth in the mouth—I was referring to the plaster model. I am pleased to say that it was put on today without the least irritation. You would necessarily think, if you saw the model, that it would irritate and cut the gingival tissue, but it does not, and I have never had one of these appliances slip. It does not make any difference what amount of pressure is brought to bear upon the springs; it is impossible for it to slip. I have never seen a case of that kind that would slip, if the cages were made in the correct manner. Another advantage of this cage is that spring wires can be attached very easily to the outside or buccal border. The wires can be soldered to it, several if necessary, while to this [illustrating the usual method] it cannot be done very well, because one has to depend upon its touching the neck or buccal surface of the molar.

SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

Forty-first Annual Union Convention.

(Continued from page 485.)

FRIDAY—*Evening Session.*

The meeting was called to order Friday evening at 8 o'clock by the president, Dr. Sharp.

Dr. Sharp called upon Dr. B. C. Nash, New York, president of the State Society, who made a few remarks to the convention in behalf of the State Society meeting for the coming year. Dr. Nash was followed by Dr. Meisburger, ex-president of the State Society.

The next order of business was the reading of a paper by Dr. R. E. LUTHER, Batavia, on "The Proper Use of a Nor-

mal and Hygienic Buccal Cavity, and Its Effect upon the Health and Nutrition of the Body."

[This paper is printed at page 551 of the present issue of the COSMOS.]

Discussion.

Dr. ALLEN JONES, M.D., Buffalo. In the early part of the paper, the essayist spoke of the cause of gastro-intestinal intoxication. That question has been studied a great deal. It has been pretty well settled that there is such a thing as normal gastro-intestinal auto-intoxication, that is, the gastro-intestinal tract is invaded by micro-organisms that are active, and by-products are formed which may be extremely toxic under conditions that are constantly occurring. These bacteria that are present in the intestinal tract have certain functions. They have the power of doing what the enzymes of the gastro-intestinal tract are capable of doing, that is, of splitting proteids into their end-products and acting upon starches to form maltose and glucose, and also of acting upon fats. So they seem to be of some use in the normal intestinal tract, and nutrition might possibly suffer if they were not active. Why is it that they may operate, and still the body suffer but little therefrom? It is largely because the organism is furnished with means of defense, which consist chiefly of the gastro-intestinal epithelium of certain organs that secrete defensive substances—such as the thyroid and suprarenal glands and the thymus, also including the excretory organs.

The essayist next spoke of the hygiene of the mouth, and I want to compliment him upon the scope and wisdom of the paper he has presented here. He spoke of so many mouths being practically cesspools, but, fortunately, owing to the good work done by dentists in an educational as well as in a practical way, the mouths of people have been very materially improved, and there is such a thing now as having a mouth that is free from many pathogenic micro-organisms, although we must not forget that even in mouths of people who exercise ordinary care, who brush their teeth three times a day, using tooth-powder and washes and rinsing their mouths with antiseptics, we find nevertheless pathogenic micro-organisms, two notable ones being the diplococcus pneumoniæ and the bacillus diphtheriæ. We know that these germs are found in the mouth, apparently lying there in a dormant state, but they are living and active, and may be at any time disease-producers if the immunity of the individual is lowered for some reason or other. The fact that these micro-organisms are present in the mouth emphasizes the importance of oral hygiene.

I was much interested in the essayist's mention of the subject of mastication and its effects on the masticatory muscles, and the effect of the act of mastication upon muscular hyperemia and upon the blood supply of the teeth and adjacent structures, etc. Here is brought forward, then, that important and well-known physiological law that hyperemia is present in the normal function, and that the more the normal function is exercised the greater the hyperemia, and that the nutrition of a part depends upon physiological hyperemia, which is more or less constant. The saliva varies, as the essayist has said, considerably, depending upon the mastication, and I think it well to remember the effect of innervation both upon the power of mastication and upon the secretion of the saliva. Mastication alone does not seem sufficient to induce a copious flow of effective saliva, that is, containing enough ptyalin to act strongly in a diastasic way. Indeed, the nervous system here is in control as everywhere, and it is possible to secrete a large quantity of inert saliva, which only acts as a lubricant and not as a digestive fluid.

I want to ask the essayist a question regarding the condition of the teeth in instances of wearing down. I suppose that there are some influences brought to bear by the bodily conditions upon the secretions in the mouth that will assist the erosive process seen at the gum margin, and I wish to know if there is any relation between erosion and the so-

called worn-down condition of the teeth that we have so markedly present in some instances, or if it is all due to the friction of the lower upon the upper set of teeth. In my experience the lower teeth have been found to be worn down more markedly than the upper.

I am glad that the essayist brought up the familiar topic of Fletcherism. I think that Fletcher has done a great deal to attract the attention of the American people to the importance of mastication, and I do not wish to detract at all from the merits of Fletcherism, yet it is likely to be carried to extremes by those who become over-enthusiastic about it. In a modified way it is to be advocated, but it can be overdone, and it is a mistake for anyone to suppose that all people will grow fat on Fletcherism, or that they all will greatly increase their general muscular power, as they will not. Proper mastication is of course to be advocated and to be practiced. Effective mastication is of value more particularly in instances where there is a deficiency of gastro-intestinal secretion. The act of mastication has something to do with inducing the proper flow of the digestive juices, and effective mastication is also of great value in cases where the pyloric orifice is narrow and the food has to be perfectly comminuted in order to pass through it.

A great deal might be said upon this subject, and I was interested in the essayist's illustration of the effect of thorough mastication upon the muscular power, and upon the nutritional processes generally.

I appreciate the honor of the invitation to take part in your proceedings, which are extremely valuable and interesting.

Dr. J. O. McCall, Binghamton. I will confine myself to a few of the points that were brought out in the paper. I am glad in the first place to see that so much attention is being given, not only by our own profession, which is natural, but by the medical profession, to the subject of the teeth and their importance. It is therefore very pleasant indeed to listen to a paper such as has been read tonight, in which the subject has been so ably treated from the physiological as well as from other viewpoints.

Following Dr. Jones' lead, I wish to say a word in regard to auto-intoxication. I had the great pleasure and benefit of studying physiological chemistry at one time, and found, as Dr. Jones has told you, that it is quite probable that a certain amount of auto-intoxication is what might be called normal. Bacteria are present and active at all times in the gastro-intestinal canal. The trouble to my mind would seem to lie more in the character of this auto-intoxication than in the fact of its existence. In other words, in a great many mouths we find teeth which are covered more or less with hard deposits, harboring bacteria, as Dr. Jones said; among others the bacteria of pneumonia and diphtheria, and other pathogenic micro-organisms. In many mouths these micro-organisms exist in such quantities that pressure on the teeth or gums around the teeth will cause an oozing out of pus, which naturally contains many of these germs. It is reasonable to suppose that in a mouth in which this pus is being formed—and we know that in many mouths a great deal is being formed all the time—the swallowing of this pus containing micro-organisms must give rise to an extremely harmful form of auto-intoxication. This brings us to the consideration of a point that has not been particularly mentioned in the paper, which I would, however, take up for a moment, *i.e.* the subject of oral prophylaxis.

Oral prophylaxis is a treatment which tends not only to prevent decay, as you are aware, but to reduce to a minimum the formation of pus in the mouth. It also tends to remove as many bacteria from the mouth as possible in a mechanical way. The influence of prophylaxis on auto-intoxication has not been brought to the attention of the profession as much as it should have been. We are told by practitioners of prophylaxis that the following-out of the treatment will cure many cases of gastro-intestinal disorders, systemic troubles, etc.; that the skin and complexion of

patients under the treatment show a marked clearing-up, that their eyes clear up, and that in many cases they gain weight. The connection at this time cannot be established absolutely, but clinical experience points to the fact that oral prophylaxis is instrumental in reducing that auto-intoxication which we know in many cases to be of a harmful character. This brings us also to the discussion of Fletcherism in the same connection. If we set out to instruct every patient who comes to us to masticate his food in the manner that Fletcher advocates, and find in half or three-fourths of the cases that pus is being formed in the mouth, we know without mathematical demonstration that under those conditions more pus is being mixed with the food and is being swallowed, vitiating the gastro-intestinal secretions. That is one reason why I think Fletcherism is not to be advocated universally.

The subject of mastication bears on the development of the teeth, as Dr. Luther has shown, and also has a great deal to do with the cleanliness of the teeth themselves. Thorough mastication of food from childhood on, and the choice of such food as will exert a massaging effect on the teeth and gums, will undoubtedly result in producing not only a better developed jaw-bone and better teeth, but a better condition of the mouth for the purposes of mastication—a result which, if obtained early enough, will exert a very considerable influence on the health of the individual throughout life.

Dr. Luther has asked me to say something on the Dental Hygiene Council of this state. I am very glad to be able to give you a little synopsis of the work which we have mapped out in a general way, and of the plans that we hope to carry out in the immediate future. The object of the Dental Hygiene Council in New York, as set forth in the motion passed at Albany last May, is to enhance the health of the human race through dental hygiene. That is to say, we hope that this movement which we are starting will become universal enough to have effect on the health of the human race in this country at least, and I think we may also say, of the entire human race. We believe, in other words, that dental hygiene, if universally practiced as we hope it will be, will result in increasing the average length of life. Professor Fisher of Yale has collected some interesting statistics on the longevity in various sections, and he points out the fact that with our present-day knowledge we should be able to lengthen the life of the present and of the next generation very markedly. Those interested in this movement feel that dentists can add a great many years to that span of life which Professor Fisher would like to see added. We feel that the public must be brought to know the importance of the teeth and their relation to the health of the body; we want to see infirmaries established not only in Rochester, but in every city of this country, and these infirmaries must eventually come, if the movement is to be a success, and must be maintained by the different public communities. We believe that through the infirmaries started by dentists or through private munificence, we can demonstrate the value of dental hygiene to a sufficient degree to enable us to ask state legislatures and city governments to establish and maintain these clinics.

These are some of the efforts that we are to make in the direction of public education, and I am glad to be able to say something on this tonight, as we have with us so many of the members of the medical profession. I hope that they will take this informal talk home with them, and when the time comes that they can help us, I hope they will cooperate with us in improving the health of the people through dental as well as through general hygiene.

Dr. Luther (closing the discussion). I wish to thank you very much for your kindness in not taking too serious issue with some of my statements which might on their face seem radical.

It was not, as I said in the paper, my intention to advocate Fletcherism or anything else, nor to maintain that the use of the teeth, even their proper use, was a cure-all for all disease; but I do

say, as I think is generally agreed, that the teeth play an important part in the physiological changes that are taking place in the body, and if I have been able to again call attention to the value of the teeth in this connection, I have accomplished all that I had hoped for.

My remarks as to auto-intoxication were intended to refer only to abnormal conditions. In tests that have been conducted on some of the secretions of the body, the feces and urine, the bacteria have been materially decreased by the proper mastication of food.

Dr. Jones spoke of erosion. Erosion, as dentists look at it, is a chemical process, abrasion is a mechanical one.

The next order of business was the reading of a paper by Henry S. Upson, M.D., Cleveland, Ohio, entitled "Insanity Due to Painless Dental Disease."

[This paper will be found printed in full at page 526 of the present issue of the Cosmos.]

Discussion.

Arthur W. Hurd, M.D., Buffalo. I have been very much interested in Dr. Upson's paper, and I wish to thank him for the care and the zeal with which he has followed this line of study. I agree with him that everything which tends to be a source of irritation in the insane, whether it be the teeth, or an abscess in the ear, or a growth in the throat, or a strain of the muscles of the eye, or trouble of the bladder or uterus, should receive correction, because everything which is a source of irritation to the nervous system, if it is not an actual cause, is a continuing irritant and may be the turning-point between recovery and chronicity. At the same time I hope the essayist will not think me over-critical if I call attention to the fact that there have been in the history of insanity many who were carried away by their zeal and enthusiasm, and attributed too much to one class of causation. There was a time when gynecological conditions instead of occupying the reasonable position as a cause that they do now were considered by some almost the sole cause. Innumerable women have been operated upon by those who considered all mental diseases to start from the genital organs. There was a time in England when an eminent surgeon was mutilating patients to such an extent that there was a call for legislative interference, if I remember correctly. There was also a time, and it has not been long ago, when eye-strain was considered the complete explanation for many of the forms of mental disease. I am perfectly willing to admit that deviations and anatomical abnormalities of the teeth, etc., may be a cause disturbing the mental equilibrium, in a certain degree, of people who are disposed thereto. There are certain thoughts which occur to me, not in the way of criticism, but in the way of study of this subject. For instance, in the last year excision of the thyroid for dementia præcox has been advocated and practiced in some quarters, but with indifferent results as yet. I mention this to show that we must get the right perspective about these elements which may enter into the causation of so serious a condition as this.

While listening to the paper certain thoughts occurred to me. One of these is—and I think that the essayist will agree with me in this—that we must not make too many general conclusions on so small a number of cases. There were, I think, seven in all reported. That degree of impaction which Dr. Upson found in these cases strikes me as being a very significant fact and one worthy of study. I was surprised that he found so many, and that should teach us to examine these cases with the skiagraph for just such conditions, because if they are so numerous they are certainly worthy of attention. But I venture to say that most of the brother members of the dental profession here do not find in their practices so large a proportion of seriously impacted teeth as the essayist has found in these cases.

May it not be possible that impacted teeth may be one of a number of stigmata symptomatic of degeneracy in these cases? Cases of dementia præcox may show symptoms of degeneracy, such as deformities of the ears, of the palate, of the skin, etc., and malformations of

the jaws or imperfect development of the teeth may be one of the several evidences of this same general condition, though I am not denying that they may be the *cause* of irritation in many cases. We also know that between fifty and seventy per cent. of cases of dementia præcox show a strong hereditary tendency. Of course that may be met by the essayist's statement that the dental conditions were simply the exciting cause acting on organs originally unsettled. In that connection I would like to use the old familiar illustration of the glass of water which, when the temperature is just right, will crystallize if subjected to a sudden jar.

Similarly we know how many of these cases seemingly originate from the shock of typhoid fever, pneumonia, trauma, or something of that sort, and we must bear that in mind when we consider the causation of dementia. Of these cases perhaps a certain proportion were considered mentally defective before, though the tendency is to lay all the blame on the apparently exciting cause and forget the underlying defect. I feel free to say that in the institution with which I am connected the secretions and the teeth have not been overlooked. We have a regular dentist in attendance at the hospital, and we have examinations made of every case where we suspect that the teeth have to do with the trouble. We have many cases that have been treated from this point of view, and many have recovered, very likely in part because this source of irritation has been removed. This leads me to emphasize my former statement that everything which is abnormal and a source of irritation to the nervous system should, if possible, be corrected.

Dr. Upson has in a most attractive way opened wider the door of investigation, and I feel that I have learned much from his paper. The necessity has also been impressed upon my mind for more thorough examinations of the jaws of our patients for imperfectly planted teeth, and that is one of the practical lessons of this admirable paper which I propose to carry out.

Dr. F. W. Low, Buffalo. I wish to congratulate myself somewhat on the very interesting session we have had this evening, because I was indirectly the cause of the pleasure which you have experienced and also the enlightenment which you have gained from this lecture. Personally, I want to thank Dr. Upson for coming to us and to assure him that he has held our attention very closely. The chairman of the Business Committee will bear me out when I say that when it was proposed that we should have this essayist with us, and he turned us down, I said to the chairman, "Do not let up until you get him here." I think the experience of this evening has justified the special effort of the committee.

There is only one remark that I wish to make in regard to this subject from the dental standpoint, that is, that sometimes we see the premonitory stages that precede any of the severe mental disorders, and we should, on noticing in our patients symptoms of this condition, call the attention of the family physician to that fact. This method of treatment should in my opinion be encouraged, even if it means the loss of a tooth. I believe in the use of the skiagraph for determining the desirability of surgical interference, inasmuch as it enables us to decide whether a case is one of impaction or severe ulceration. Some of the illustrations which the essayist has shown us have clearly illustrated how ulcerations of long standing have caused considerable absorption of the bone, and I believe that all possible sources of irritation should be removed if disturbed mental conditions are present, on the chance of one in a thousand of our patients being benefited. If it save the mental health of but one person in a thousand, we are justified in removing the bad teeth of every individual threatened with dementia.

Dr. Putnam. I am very glad indeed to express my appreciation of Dr. Upson's paper, and also of the very able discussion of Dr. Hurd. I have heard a great many lectures in the last twenty years upon the causes of insanity, upon the bearing of various reflex irritations, upon the whole gamut, from eye-strain, nasal polypi, adenoids, enlarged tonsils, impacted cerumen pressing upon the ear-

drum, gastro-intestinal irritations, irritation from the structures of the thymus gland, scars which imprisoned the nerves in their grasp, irritation of the flatfoot, and finally ingrowing toe-nails. All of these causes I have heard mentioned as potent in the production of functional nervous diseases. All of them have been well and ably maintained; all have been backed up by statistics and interesting cases, and I believe all have been true. Some of us see the light from one direction and others from another, but though all these various observers seek the truth in different sections of the broad field, it behooves us in studying this whole question to collect all their reports and then go after the patient much as the Irishmen go to the Donnybrook fair—wherever you see a head, hit it. Wherever there is a source of irritation, remove it. Just what proportion of cases is attributable finally to the teeth, no one knows, not even Dr. Upson, who is a pioneer in this work; he has proved that a certain number of cases are due to the teeth, and in a certain proportion of these has afforded relief.

Allied to the question of insanity is the question of epilepsy. Epilepsy and its relation to the teeth has been studied much longer, so that in looking up the subject in the prize essay of Hare, who received the Belgian prize in 1889, and in the work of Brubaker in the Philadelphia *Medical and Surgical Reporter,* 1888, we find that some eighteen cases of epilepsy purely due to caries of the teeth have been reported. In the German magazine *Deutsche Monatsschrift für Zahnheilkunde,* September 1885, three cases of epilepsy are reported in which the error was distinctly referred to the movements of the tongue in keeping the food from certain teeth which were carious, and these three cases were reported cured after the removal of the carious teeth. Then Bailey, Hamilton, and Booth reported cases of epilepsy dependent on caries of the teeth and cured by the removal of those teeth. We know that epileptics may become insane and that a large proportion do, therefore we can assume that a certain proportion of these people who were cured by extraction might have become insane later.

I believe that the essayist deserves great credit for being a pioneer along this new road of investigation, which I believe will stimulate and encourage us to make examinations of the patients' mouths in addition to the other examinations that we have been accustomed to make. Such examinations, together with other reports and records, will determine the importance of this source of irritation. It has not found its place yet, but is going to, although this will require a large number of observations carried out over a great many years, for the reason that a great many of these cases and reports are of the type of insanity which is classified as recurring. Most of these cases have a recurrence within a year, and as I understand it, the period for recurrence in Dr. Upson's cases has hardly yet arrived; but if his patients do not develop new attacks, he will certainly have given us a valuable addition to our therapeutic armamentarium.

I shall be glad to take up this work, and to study along the lines which the essayist has pointed out, and after further investigation I shall be willing to become one of his disciples.

Dr. Low. Dr. Roberts, who was with us this afternoon, reported to me a case of epilepsy in a young girl of fourteen years of age which was always developed at the time of dressing. The family physician insisted that he be allowed to attend the dressing, and he found that when the young lady used the tooth-brush, she immediately had an epileptic fit. On careful examination he found a bristle of the tooth-brush driven into the cervix of the gum, and the removal of that bristle cured the epilepsy. Several years have now elapsed, and the young lady has not suffered since.

I would like to speak of one point which Dr. Hurd brought out. He spoke of the age of puberty as being the particular time when these troubles occur. This is the time when the third molars are likely to have developed to the point where they may become impacted, and until they have reached that point they would not be so apt to cause irritation.

That, I think, is rather in favor of Dr. Upson's contention.

S. A. Dunham, M.D., Buffalo. I would like to speak of two cases where nervous disorders were produced by patients going to the dentist to have work done. A young lady of very nervous temperament thought that she needed a tooth extracted. The dentist, after examination, refused to extract it. As the patient insisted, however, the tooth finally was extracted. She had other work done, and then reached the point where her nerves failed, when she felt that something in her brain gave way. She was subsequently thrown into a state of fear, had a long illness, and finally recovered. The conclusion is that in some of these cases we should be very careful in doing dental work. It is very unpleasant for some people to go to the dentist, and very often the shock to the nervous system causes a nervous breakdown.

Another case I recall was that of a lady who was told by her dentist that she had necrosis of the jaw. She immediately associated necrosis with decay, and began to imagine that her jaws would decay and she would become disfigured for life, and was thrown into a state of melancholia. There was of course an exciting cause, but these exciting causes are just what we should prevent. If patients are in a very nervous state of fear, or predisposed to nervous diseases, we have to be very careful as to submitting them to the ordeal of having a great deal of dental work done. This patient attempted suicide by taking antifebrin. She eventually made a good recovery after nine months' illness.

Dr. C. S. Butler, Buffalo. It would probably be well for us to pause for a moment, not only to voice our appreciation of the presentation made before us tonight by Dr. Upson and of the discussion of the subject, but also to express our pleasure in having with us so many members of our sister profession —our physician friends.

The subject of the discussion and this gathering emphasize not only the fact of the close proximity of the fields in which we labor, but it is an indication of the tendency of the times. Men are striving toward a common purpose, and that purpose in our professional work is the alleviation of present suffering and the prevention of suffering for the future. It is very gratifying when we can come together in this way for the presentation and discussion of a subject of mutual interest and importance to us. I myself feel grateful for the assistance of our medical *confrères,* and I am sure this is the sentiment of us all.

Dr. Upson (closing the discussion). I wish to express my thanks to the society for the interesting and instructive comments which have been made on my paper. Owing to the lateness of the hour I will add only a few words with reference to the two cases mentioned by Dr. Dunham. There is no doubt that great harm can be done to nervous and mental patients by the incautious suggestion that they may incur disaster. This is especially to be avoided in operating on the teeth, and a patient should always be encouraged, and assured that no harm will be done by dental measures. The good results that follow operative procedure by the remedying of irritant conditions are strengthened rather than weakened by encouragement, while the opposite is well illustrated in the two cases reported by Dr. Dunham.

The meeting then adjourned until Saturday morning.

Saturday—*Morning Session.*

The meeting was called to order Saturday morning at 9.30 o'clock by the president, Dr. Sharp, when papers were read on "Preliminary Educational Requirements"—(*a*) "In the Province of Ontario," by Robert J. Reade, Toronto, Canada; (*b*) "In the State of New York," by J. Wright Beach, Buffalo.

The President then declared the meeting adjourned until the next annual session.

Saturday morning and afternoon were devoted to clinics.

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PHILADELPHIA, MAY 1910.

EDITORIAL DEPARTMENT.

THE PARIS MEETINGS.

DURING the Easter holiday the dental activities of Europe were centered in a series of meetings held in Paris, France, which were signalized by events of more than ordinary importance.

The Fédération Dentaire Internationale held its tenth annual meeting;—the American Dental Society of Europe held one of the most successful and interesting meetings in its history,—and the two bodies united in the ceremonies attending the unveiling of a monument erected to the memory of Horace Wells, the American dentist to whom is accorded the honor of the discovery of surgical anesthesia. Last but not least, the first award of the prize created under the W. D. Miller Memorial prize fund was awarded to Prof. Greene Vardiman Black of Chicago.

The work of the Fédération Dentaire Internationale was concentrated more particularly upon the subjects of public dental hygiene and dental education, the commissions dealing with these topics

occupying the greater part of the attention of the members. Under the enthusiastic leadership of Dr. Jessen of Strassburg the subject of public dental service and the dental hygiene of school children was thoroughly discussed, and organized plans for the extension of the work throughout the world were formulated. As evidence of the widespread interest which this phase of the public health betterment has aroused, it was announced that His Majesty King Gustaf V of Sweden had consented to act as patron of the International Hygiene Commission, and as its Protector to assist in the promotion of its work of arousing interest and activity in dental hygiene throughout the world. The plans of the commission are inclusive in scope and have as their object the effective organization of the work of public dental hygiene upon an international basis.

In the department of dental education Professor Godon announced the broad scope and universal applicability of the ideals for which the F. D. I. was working. It is the purpose of the organization to bring about a unification of educational methods upon the basis of a curriculum which it is hoped and believed will become standardized and accepted in all countries, growing out of which, and by reason of such uniformity of curriculum, a system of international reciprocity might be attained, and even a uniform degree or qualification might properly result. The work of the F. D. I. for the past ten years, since its organization in Paris at the close of the Third International Dental Congress, has persistently tended toward these desirable ends, and through the activities of its Commission on Education has made most encouraging progress. Having no legalized power to enforce its conclusions, it has nevertheless exerted a powerful influence upon educational methods as well as upon professional opinion, solely by virtue of the interests which it represents and the seriousness, faithfulness, and openmindedness with which it has performed its work. For these reasons the F. D. I. exerts an influence as a moral force which in effect is farther-reaching and more definitely permanent than it could be if operating under statutory authority.

A striking demonstration of the changed relationship of affairs which has been wrought out in the last decade was furnished by the splendid banquet at which both the member-

ship of the American Dental Society of Europe and that of the F. D. I. participated, and where under most delightful circumstances of hospitality and good-fellowship old differences were wiped out or forgotten and the promise of a new and harmonious future professional relationship was born. We hope that the occasion was one of pleasure and profit to our European colleagues,—and if it is also a greater pleasure, as it is said to be more blessed, to give than to receive, then the greater pleasure must have been theirs, for their gift of hospitality, of professional good-will, was generous beyond expression. To the Americans present it was an occasion which stirred the patriotic sentiment in every one to listen to the splendid eulogy pronounced by the eminent physiologist Professor Dastre upon Horace Wells; and again, to see our European colleagues enthusiastically award the first Miller prize to our distinguished countryman, Professor Black.

Truly, as one of our hard-headed Scotch colleagues said during the closing exercises of the combined meeting—"The professional blood is thicker than water, and if these occasions continue it must inevitably follow that the blood will grow thicker and the water thinner."

The next meeting of the F. D. I. will be held in London in August of 1911 in connection with the annual meeting of the British Dental Association, at which time definite preparations for the holding of the Sixth International Dental Congress in London in 1914 will be made.

A REMARKABLE BENEFACTION.

Announcement has recently been made of a gift by Mr. Thomas A. Forsyth, a citizen of Boston, Mass., of the sum of $500,000 as a foundation for the establishment of the Forsyth Dental Infirmary for Children, to be located in Boston, for the gratuitous care of the teeth of the poor children of the Boston public schools up to the age of sixteen years.

A bill now before the legislature of Massachusetts provides for the incorporation of the Forsyth Dental Infirmary for Children under a board of trustees consisting of Thomas A. Forsyth, Frederick W. Hamilton, Edward W. Branigan, Harold Williams,

John F. Dowsley, Ervin A. Johnson, Timothy Leary, Sumner Robinson, Chester B. Humphrey, "their associates and successors." A suitable tract of land located on Hemenway st. and the Fenway, Back Bay, has been secured, and plans for the erection of the building are now in course of preparation.

This benefaction is one which stands entirely alone in the annals of philanthropy. Various similar activities in a philanthropic way have been at work and have done good service, but no such comprehensive, and we may say aggressive, attack upon the problem of public dental hygiene on a large scale has ever before been attempted. With a thoroughly equipped plant, and with an effective working organization such as it is intended to create under the Forsyth foundation, the opportunity for a decisive test of the value of dental service as a health measure is fully provided for, so that the Forsyth experiment, both in its economic, sociological, and hygienic relationships, is one which will be watched with deep interest not only by practitioners of dentistry, but by students of public health problems the world over.

The gratitude of the dental profession everywhere is abundantly due to Mr. Forsyth for his beneficent support of the contention which dentistry has long made, and thus far has been able to demonstrate only in a comparatively limited way—the contention, namely, that proper care of the teeth and oral cavity is the best safeguard against bodily disease, and is therefore among the most important of public health measures.

It may be mentioned that the Forsyth Dental Infirmary for Children will be established by its founder as a memorial to his brother, the late James Bennett Forsyth, who died January 11, 1909, and who had arranged in his will for the carrying out of a similar project, though he died before the instrument was finally executed. His surviving brother, being his legal heir, has carried out his deceased brother's wishes, and the Forsyth Dental Infirmary thus becomes a memorial of James Bennett Forsyth.

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BEHANDLUNG DER OKKLUSIONSANOMALIEN DER ZAEHNE, ANGLE'S SYSTEM. [TREATMENT OF MALOCCLUSION OF THE TEETH.] Seventh edition, greatly enlarged and entirely rewritten, with 630 pages and 641 illustrations. By EDWARD H. ANGLE, M.D., D.D.S. (Authorized German translation by J. GRUENBERG, orthodontist, Berlin. Edited by Dr. OPPENHEIM, Vienna.) Berlin: Hermann Meusser, 1908.

Our previous review of the seventh edition of Angle's "Treatment of Malocclusion," published at page 425 of the April 1908 issue of the DENTAL COSMOS, leaves nothing in the way of criticism as to the English original.

A review, therefore, of the present volume, which is the authorized German translation, by Dr. J. Gruenberg of Berlin, edited by Dr. Oppenheim of Vienna, must needs be of a literary character; and indeed, as an example of a masterly piece of translating, this work deserves the highest praise. Anyone familiar with the obstacles that the translation of a highly specialized text into another tongue presents will wonder at and appreciate the beautiful flow of its German rendering and the clearness of style by which the translator proves himself to be a master of his mother-tongue and thoroughly versed in the acquired English language, besides showing himself to be a star pupil of the Angle school. A great many translations of English or American articles on orthodontia that we have perused in German magazines resemble a pot-pourri of English technical terms linked together by a minimum of indispensable German verbs and still more troublesome auxiliaries, a sort of dental "Pennsylvania Dutch." Gruenberg has produced a really German book; even terms which Angle had to coin for this comparatively recent specialty of dentistry are ingeniously rendered by perfectly intelligible, at times even surprisingly expressive and descriptive German equivalents. We can readily believe the author's assertion that this translation represents the result of laborious work and self-sacrificing pains, the book itself testifying most eloquently to the careful and conscientious efforts of its interpreter.

For years literary pirates have filched Angle's property, not only palming off his thoughts as original, but often reproducing them in such distorted form that their meaning was obscure and their value problematic. German orthodontists ought therefore to welcome a work that safeguards the priority and scientific purport of the author's intellectual property, and which undoubtedly will give new inspiration to our German colleagues to co-operate in and still further perfect a specialty which involves the health, the beauty, and the mental and physical comfort of all those unfortunates who suffer from anomalies of occlusion of their teeth.

ANOMALIES DE L'OCCLUSION DENTAIRE ET ORTHODONTIE. [ANOMALIES OF DENTAL OCCLUSION AND ORTHODONTIA.] By LUÍS SUBIRANA MATAS, Surgeon Dentist, Founder of *La Estomatología,* Laureate (two prizes) of the Spanish Odontological Congress of Barcelona 1899, Member Committee on Reform of Dental Instruction in Spain, Hon. Member Odontological Societies—of Catalonia, of the Baleric Islands, of Malacca, of Guipuzcoa, of Valencia, Government Delegate to the Fourth International Dental Congress, St. Louis, Knight Civil Order of Alfonso XII, Hon. President Odontological Society of France, Vice-president Spanish Odontological Society. Pp. 402, with 427 illustrations. Madrid: José Blass. 1909.

This work has grown out of a collection of histories of cases into a stately volume on orthodontia, of works upon which subject a scarcity still exists in European dental literature. The author not only presents a review of the various theories and schools in orthodontia, and encourages his European *confrères* to take up this important specialty, but also wishes to attract the attention of all who may be interested in any new specialty of science at large. The book is presented in a handsome garb, and with his facile pen, which has been tested in many previous works of professional purport, the author has indeed created a work which should admirably fulfil his aim.

Starting with an attractive treatise on the esthetic consideration of facial beauty as conceived by the artist's eye and that of his strongest champion, the orthodontist, he proceeds to dwell at some length on the old and modern theories of normal occlusion. In a complementary chapter, the author's hobby, *i.e.* dental nomenclature, receives its due attention; then follows a strong plea for more scientific deliberation preceding any and all cases of extraction, which if performed uncritically may produce such dire consequences in originally normal mouths. The author's invention, the teradontograph—a full description of which was published in our February issue of 1909, p. 265—and its usefulness as a controlling record in following up the progress effected in regulating cases, is discussed in one of the thirteen chapters, among which we note especially those on the age factor in regulating, the influence of orthodontia on general health and on racial betterment, measures preliminary to treatment, extraction in regulating, surgical correction, and retention. More space might have been devoted to the chapter on orthodontic mechanics, which seems too brief in comparison with the general proportions of the book.

The presswork and the illustrative material deserve high praise. American orthodontists will find it interesting to compare the facial characteristics produced by anomalies of occlusion in a Latin race, from which Dr. Subirana's cases are principally taken, with the peculiarities which they themselves observe in their own practice. R. H. R.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Deutsche Zahnaerztliche Zeitung*, Berlin, January 23, 1910.]

BROMURAL AND ITS APPLICATION IN DENTISTRY. By Dr. Dietrich, Heidelberg.

Bromural has acquired a prominent place among modern hypnotics, its sedative and sleep-inducing properties not being impaired by any secondary narcotic effects. The available extensive literature and clinical reports on this compound of monobrom-isovalerianylurea all go to prove that bromural is an excellent hypnotic in mild cases of insomnia, in marked excitability, and for fretfulness in children, and that its administration is perfectly harmless. Extensive experiments in man and animals have shown that no untoward changes in the organism are produced even after prolonged use, a dose of six grams daily in adults and one gram daily in children producing no toxic symptoms. The sedative action of bromural is not due to the bromin present, but to the isopropyl group contained in the valerianic acid. The potency of the latter is increased by the introduction of a halogen atom and by the union with urea.

Like Dr. A. J. Hecker of New York (Dental Cosmos, July 1909, p. 844, "Mild Sedatives in Dental Practice"), the author has used bromural in nervous dental patients with excellent results. In over forty cases of nervous patients 0.3 gram of the drug was given, symptoms of restlessness, fear, and palpitation of the heart disappearing in from twenty to thirty minutes. If an anesthetic is to be administered to a very nervous patient, a dose of bromural is indicated before anesthetization, the symptoms of excitement disappearing after about thirty minutes. If taken upon an empty stomach, bromural does not cause any nausea; 0.3 to 0.5 gram of the drug is dissolved in water, and from fifteen to thirty minutes later the anesthetic is administered. If no bromural has been given before the anesthesia, a dose may be administered afterward to remove nausea, symptoms of collapse, vertigo, and headache. Nervous patients often complain, after a prolonged filling operation, of insomnia complicated with a continued sensation of burring. One or two tablets in water given on retiring generally insure such a patient a restful night.

Bromural is not contra-indicated by affections of the heart and stomach, as none of the disagreeable after-effects of the bromids, such as bromism, headache, gastric disturbances, etc., appear. Sleep produced by bromural does not differ from natural sleep, the patients awaking fresh and rested without any stupor, depression, or intoxication as produced by other hypnotics. In severe types of insomnia, however, such as are due to catarrhal cough, delirium, fever, or severe pain, bromural is not potent enough. In cases of severe inflammation of the mouth, parulis or very painful periostitis, large doses of bromural are useless, and antiphlogistic treatment, even morphin if necessary, must be resorted to. In forty-seven cases of pain after extraction a few tablets of bromural insured the patients relief and a night's rest. In light cases of migraine and neuralgia, also in pain arising from an arsenic dressing, bromural renders good service. In impatient patients who demand immediate extraction of useful teeth, the therapeutic action of bromural, enhanced by suggestion, may often save a valuable tooth. Thus bromural exhibits properties which invite experiments with it in dental practice.

[*Archiv fuer Zahnheilkunde*, Berlin, January 1910.]

ALUMINUM DENTURES. By Dr. F. von Widekind, Berlin.

Aluminum dentures are not indicated in every patient who needs an artificial denture. If the patient's saliva is slightly acid, an aluminum plate is easily attacked, and produces a disagreeable metallic taste in the mouth. Neither are aluminum plates applicable in mouths with unextracted roots or in

patients whose oral hygiene is imperfect. Aluminum is best indicated for entire upper and lower plates in edentulous cases. The metal used must not be too soft; it is best to use so-called hard aluminum. The thickness of the plate varies according to the size of the denture or the height of the arch. Aluminum plate of a gage lower than 0.7 mm. should never be applied, gage 0.8 to 0.10 being the most suitable average. The annealing of the plate must be done very cautiously, as the metal easily becomes soft; in order to obtain the correct heat, the plate is oiled and held over the flame till the oil is burned off. It is then allowed to cool in the air, not dipped in water. For swaging the aluminum plate, the author prefers a die and counter-die of Spence metal, a press, not a mallet, being used for the adaptation of the plate. If a harder counter-die is wanted for any reason, a plate of lead of about 1 mm. thickness, and somewhat larger than the aluminum plate is pressed between the two Spence metal dies. The lead plate is left lying on the die, the protruding ends are bent and oiled. The counter-die is then removed from the upper part of the flask, this portion of the flask is oiled, set on the lower half containing the die, and the counter-die is poured with Spence metal, the lead plate adhering firmly to this counter-die, which is almost as solid and hard as an all-lead counter-die. The press is to be preferred to mallet blows, as the dies are not injured, and the plates do not tear as they sometimes do under mallet blows. Not too much pressure should be exerted, as the rugæ and other elevations might be pressed flat. After swaging, the plate is thoroughly washed with soap and water, or still better, boiled in soap-water, and then pickled. For the latter purpose the aluminum plate is laid for a few minutes in a ten per cent. solution of caustic soda saturated with sodium chlorid, then vigorously rinsed with water, again laid in the pickling solution for from one-half to one minute, and again thoroughly rinsed and dried. The teeth are then ground to fit, set up with wax, and tried in the mouth. In trying in, the places where the rubber is to be attached are marked with a sharp instrument. Teeth and wax are removed and replaced, after the contrivances for holding the rubber have been attached. As rubber and aluminum do not enter into direct combination, special contrivances must be very carefully provided for in order to prevent the separation of the rubber and the aluminum. The plate should always be roughened with a chisel. The rubber is fastened to the plate by means of rivets or aluminum threads, many devices for this purpose being on the market. Egner recommends burring holes into the plate from the palatal side, threading these holes, and introducing threaded aluminum wires, which on the palatal side are cut off flush with the plate, and on the lingual side are left protruding about three millimeters. This portion of the wires can be bent over before packing the rubber or riveted after vulcanizing. In order to avoid contact of a partial aluminum plate with the natural teeth or with amalgam fillings, the plate is filed out around the teeth and built out with rubber, which also insures a firmer attachment to the teeth. If bands are used, care must be taken that they do not come into direct contact with the aluminum plate, as otherwise galvanic decomposition takes place. Flasking and packing is done as in ordinary rubber plates, care being taken, however, that no particles of wax or resin adhere to the roughened surface of the plate. To avoid this, the plate is rinsed several times with boiling water, and then the case is immediately packed and pressed. In places where the gingivæ are to be reproduced, pink rubber is used; in all other places black rubber is preferable, inasmuch as it adheres better to aluminum.

After vulcanizing, the piece has an ugly gray color; this disappears after washing and brushing with a solution of 30 gm. of borax in 1000 gm. of water with the addition of a few drops of ammonia. If this is not efficient, the pickling solution as described above is applied with caution, for the heated soda solution attacks the rubber and loosens its union with the plate. The plate is polished with sand-paper or emery cloth, powdered pumice, and finally with prepared chalk and stearin oil and a buff wheel. After washing in benzin or with soap and brush the plate is ready for insertion.

For lower cases with remaining incisors, if the aluminum plate is to carry the artificial back teeth on both sides, a plate of about 1 mm. is used, and over this base-plate a saddle is swaged as reinforcement, being attached to the base-plate with screws or rivets.

[*Le Laboratoire et Le Progrès Dentaire*, Paris, December 19, 1909.]

CAST UPPER METAL DENTURE WITH SUCTION CHAMBER. By M. P. Camille.

For practitioners who, in spite of the perfect adaptation of a cast metal plate to the gums, would still not dispense with the suction chamber, the following method of casting a metal plate with suction chamber is recommended: On the plaster model the air-chamber pattern is fixed with hot wax. The model and pattern are then oiled, and a sheet of wax of the thickness which the plate is to have is adapted to the model by means of a small sponge dipped in hot water, which under very moderate pressure produces a perfect adaptation of the wax plate to the model. After being adapted, the wax plate is trimmed with a spatula. As the wax plate adapts itself around the air-chamber pattern at very sharp angles, which if reproduced in the cast plate might injure the tongue, or as the wax plate might break around the edges of the air-chamber pattern, a little wax is filled up around the air-chamber pattern and tapered off with a spatula. With a piece of very fine linen the wax plate is polished without any other means, such as talcum, etc., as smoothly as possible, in order to avoid unnecessary work on the cast plate. The sprue wire is then fastened to the wax plate on the model with a drop of hot wax, and after the usual precautions, such as cleaning the lingual surface of the wax, a very thin layer of finely grained investment material is flowed over the wax, and then a layer of investment material of larger grain. After this investment material is sufficiently dry, the whole is lifted from the plaster model. Generally the air-chamber pattern will come away with the wax plate. If not, it is removed from the plaster model and set into its place on the palatal side of the wax plate. With a slightly heated burnisher the edge of the wax is burnished over the air-chamber pattern, and after the wax has cooled, the pattern is withdrawn from the air-chamber by sticking a needle into the pattern, and giving it a few gentle pulls. The borders of the air-chamber will then be very sharply outlined. The rest of the casting is done in the ordinary way, that is, the palatal surface of the wax plate is cleaned, and a layer of finely grained investment material and over that a layer of coarser investment is poured. The plate is then invested in the flask with investment material of coarse grain. After one hour the flask is ready to be heated, and the casting can be finished after approved methods.

[*Deutsche Monatsschrift fuer Zahnheilkunde*, Berlin, November 1909.]

RESULTS OF HISTOLOGICAL INVESTIGATIONS OF THE APEX OF THE ROOT AFTER TREATMENT OF THE ROOT-CANAL. By Dr. Erich Baumgartner, Graz.

As a result of histological findings the author arrives at the following conclusions, which are not only interesting for the histologist but also very important for the practitioner: A complete removal of the pulp is possible in but very few cases; in the majority of cases merely a "high amputation" of the pulp is accomplished. If the latter is ramified, the branch nearest to the pulp-chamber is the nearest way by which the pathogenic micro-organisms penetrate into the pericementum, etc. In all the preparations examined it was noted that the pathologic changes in the root-canal walls and the pulp decrease toward the apex. One is therefore led to assume that the resistance of the wall increases in those portions which are formed by cementum, and that the dentin succumbs more rapidly to the action of the bacteria. In none of the preparations did the pulp-branches, by which the bacteria must have entered, show a marked pathologic condition. The pathogenic germs by themselves therefore produce very little or no destruction of the pulp tissue and dentin. The areas of termination of these routes of infection, however, in the pericemental membrane exhibit extensive destruction of the surrounding tissue. Hence in the course of the pathological process a new destructive factor must be at work. It is the tryptic and proteolytic ferment of the polynuclear leucocytes that has this destructive action on the tissues. Dental therapy, therefore, can only tend to prevent a further invasion of pathogenic germs into the inflamed tissue. The destruction of the micro-organisms that have already invaded the pericementum, etc., must be left to the protective forces in the body, *i.e.* the

phagocytes according to Metchnikoff, or the bactericidal forces in the blood according to Nuttal, Büchner, and Nissen, or the opsonins according to Wright. From the histological preparations it also appears that the short stumps of the pulp, after so-called extraction of the latter, behave exactly like the pulps in roots after amputation of the pulp, that is, the faculty of regeneration or tendency to granulate of these stumps is very small or *nil.*

[*Deutsche Monatsschrift fuer Zahnheilkunde,* Berlin, February 1910.]

INVESTIGATIONS ON THE OSMOTIC PRESSURE OF SOME LOCAL ANESTHETICS. By Dr. H. Buente and Dr. H. Moral, Greifswald.

The very able investigations of Dr. Buente and Dr. Moral, researchers at the progressive Dental Department of the University of Greifswald, with its director Dr. Guido Fischer, are based on the following requirements for every and any local anesthetic: The solution must not exert any deleterious influence on the blood or the tissue; it must not contain, for instance, any formalin or muriatic acid, etc., according to the first medical principle, never to inflict any harm! It must not change the pigments in the blood; it must not have a puffing or sloughing influence on the tissue, must not cause hemolysis, consequently must be isotonic with the juices of the tissues. The anesthetic must be limitable to a minimum, in accordance with the principle to use as much as necessary but as little as possible. It must not react acid. It must be as free as possible of indifferent, superfluous admixtures, such as gaultheria, etc. It must contain a harmless antiseptic in such a concentration that the solution itself has no disinfecting action, but does not permit the multiplication of already present bacteria. The authors have tested nearly all local anesthetics on the market, proprietary and official, and offer the following *résumé* of their carefully tabulated results: The membrane of the blood corpuscles is perfectly permeable to novocain, tropacocain, etc. A solution of novocain can never exert any osmotic pressure on the blood corpuscles. Novocain, if intended to represent a solution which is isotonic with the blood corpuscles, must be dissolved in a 0.92 per cent. sodium chlorid solution. Novocain has a small hemolytic property, which in presence of a 0.92 per cent. solution of sodium chlorid disappears entirely, if the novocain is not present in too strong concentration. Solutions of novocain in a 0.625 per cent. sodium chlorid solution do not produce any hemolysis, but a swelling of the blood corpuscles. If the test preparation is left standing for any length of time, unmistakable signs of beginning hemolysis are noticeable. If the percentage of sodium chlorid in a novocain and sodium chlorid solution is only 0.6 per cent. or less, hemolysis occurs. No alkali nor any salts reacting alkaline must be added to the novocain and sodium chlorid solution, otherwise precipitation of the novocain takes place. The two per cent. novocain solution can be reduced to 1.5 per cent. without impairing its action, in children and weakly patients even to 0.5 per cent.

Solutions that contain deleterious materials are unfit for injection. This also applies to the injection of Hoffman's anodyne—as suggested by Eckstein*—as it coagulates the blood corpuscles. The author's solutions of novocain, sodium chlorid, and thymol (novocain 1.5, sodium chlorid 0.92, thymol 0.02 in 100 of water, or: novocain 0.5, sodium chlorid 0.92, thymol 0.02, in 100 of water (to each ccm. of solution one drop of synthetic suprarenin 1: 1000 to be added), with which most accurate experiments have been made, fulfil all theoretical and practical requirements. Their osmotic pressure is equal to that of the tissues, they have no hemolytic action on the erythrocytes, and do not harm the tissues.

These experiments, as Dr. Guido Fischer remarks in a postscript, mark a great advance in an heretofore little explored field, *i.e.* the biochemical action of local anesthetics, and tend to do away entirely with proprietary preparations. The fact that very good results can be obtained in weakly patients with a 0.5 per cent. novocain-thymol solution, as modified by the authors, accentuates the necessity of individual treatment in local anesthesia in the same way as it is being advocated in general therapeutics.

* See Cosmos, September 1909, page 1123; October 1909, page 1227.

[*L'Odontologie*, Paris, December 30, 1909.]

FERMENTS, ESPECIALLY LACTIC FERMENT, IN ORAL THERAPEUTICS. By Dr. L. Frey and Dr. B. de Nevrézé.

The use of microbic cultures in oral therapeutics is justified by our clinical knowledge of the oral microbic flora, by the experiments conducted with these microbes by Galippe and Miller, and by clinical experience. Among the ferments used as therapeutic agents the authors give perference to lactic ferment, which recommends itself by its easy mode of application and by its harmlessness to the tissues. Its action in most cases does not preclude any of the ordinary dental operations, rather aids these. In fetor from the mouth it can be regarded as a certain cure. In pyorrhea that is distributed all over the mouth, the authors introduce some lactic ferment powder into the gingival pockets, at the same time following the usual method of treatment, such as curetting, immobilization, etc. They also recommend the dissolving of lactic acid tablets between the lips and the teeth or the cheeks and the teeth, preferably on an empty stomach, and in the morning and afternoon, in order to avoid any untoward gastric reaction. In pyorrhea this adjuvant treatment is continued from two to three weeks every month. As proved by the absence of new carious portions in the teeth, the enamel is not attacked, owing to the absence of gelatinous plaque and the small strength of the acid (1: 1000). In stomatitis with or without ulcerations, in ulcers of the alveolus or the maxilla, and in fetor from the mouth, the continued use of the ferment is indicated until the disappearance of the symptoms. In all these cases the tablets are dissolved preferably near the lesion itself. The vitality of these lactic bacteria is not impaired by the dry cultures—which are absolutely odorless and palatable.

[*Revue Trimestrielle Suisse d'Odontologie*, Zurich, No. 3, 1909.]

AQUEOUS AND OLEAGINOUS SOLUTIONS IN THE THERAPY OF CARIES. By L. Joly, Paris.

The hard tissues of the tooth are much more easily penetrable than one is tempted to believe, except in senile and strongly calcified teeth. In treating caries of the second degree the mechanical cleaning of the cavity must be followed by the application of some medicament intended to penetrate and sterilize the detinal canaliculi. The degree of calcification and the proximity of the pulp are the most important factors to be considered in the penetration of the dentin, and these considerations must determine the choice of the medium of the drug solution. Most patients present insufficient mineralization and consequently great frequency of caries of their teeth, and, in these, rapid reaction of the odontoblasts is hardly to be hoped for. The less dense the dentin, the more easily it is penetrable to aqueous solutions, while the penetration of the essential oils, so frequently employed in dental therapeutics, is doubtful. Before applying any of the essential oils the dentin is generally dehydrated with hot air or absolute alcohol or both. This produces a destruction of the cellules, which is the greater the more closely the pulp region is approached. It is possible that the zone of dentin that has been dehydrated and penetrated with an essential oil, which is, however, always doubtful, may be tolerated by the surrounding tissues. But it seems more logical to employ water as a medium for drugs in live tissue that contains 1 per cent. of water. Aqueous solutions may be applied in two ways, directly by means of pressure or indirectly by dressings. Pressure always involves the danger of forcing micro-organisms back toward the pulp and setting up a secondary infection. Moreover, the operator runs the risk of producing the death of the pulp by trauma. The method of applying dressings, although it requires time, has the great advantage of permitting a varying of the effect of the medicament in proportion to the mineralization of the tooth by applying solutions of different strength. This seems the most rational means of stimulating the reaction of the odontoblasts without producing any modifications in the tissues. Although the number of medicaments soluble in water and suitable for the treatment of dentin is limited, still there are some very efficient ones, especially the aqueous solutions of various strength of silver nitrate and zinc chlorid.

In pulpless teeth the obturation of the apex is always difficult, and the ultimate success of treatment of caries of the third and fourth

degrees depends upon the prevention of reinfection. Dehydration of the dentin is one of the means that insures greatest success, and the benefits of dehydration are preserved by penetrating the dentin with oleaginous media, thereby preventing the decomposition of the dentin. Very good results are obtained by the use of essential oils, although these are not the only media, and vaselin oil, for instance, is very serviceable. Liquid vaselin is a neutral substance that does not oxidize nor saponify. Alkalis or acids have no action upon it, except nitric acid and sulfuric acid, which decompose it at high temperature. It is insoluble in water, slightly soluble in alcohol, readily soluble in sulfuric ether and chloroform, and completely dissolves menthol, partly the essences and carbolic acid. It has an extractive power on a great many substances and a great dissolving power on alkaloids, but not on their salts.

The formula suggested by the author for treatment of caries of the fourth degree is as follows: Pure sterilized vaselin oil, menthol, chloroform, equal parts of each. The root-canal is desiccated as completely as possible, and temporarily a cotton fiber saturated with this mixture is inserted. After the root-canal is filled with gutta-percha or chloro-percha, the cavity is cleaned by means of a pellet of cotton dipped in sulfuric ether, in order to remove all traces of oil, an indispensable precaution in cement fillings.

[*La Province Dentaire*, Lyons, February 15, 1910.]

AN IMPROVEMENT ON THE TRANSVERSE BAR OF BRYAN IN BRIDGE WORK. By Dr. W. Thiersch, Basel.

In order to lend additional support to weak abutments in bridges in the upper jaw, Bryan unites the two portions by a soldered transverse bar. This bar as at first employed was firmly soldered to the bridges, and any necessary repair deprived the patient of the use of both bridges. Bryan therefore now solders this bar to only one bridge, attaching the other end by means of a screw, so that in case of necessary repairs only one bridge has to be removed. Thiersch offers an improvement on this bridge by constructing it in three portions, the bar being fastened to the two bridge portions by means of screws; this method also facilitates the technical work. The screws as applied by Bryan often become loose under the strain of mastication. Thiersch therefore makes a box cavity in the abutment of each bridge, into which the bar is solidly embedded. The bridges are cast independently of each other, and the box cavity on either side is made to extend down to about half the height of the bridge, thus permitting several turns of the screw. If the abutment crown lacks in depth, a step can be made in the box cavity with platinized gold, and in this step the transverse bar can be securely anchored with iridio-platinum screws. The screw-hole must be made with the utmost accuracy, in order to insure the greatest possible solidity of attachment. The two bridges are first worn by the patient for several days to bring about perfect adaptation, and then finally seated. The transverse bar is made on a model cast from an impression that is taken with the bridges in the mouth, and screwed into the box cavities provided in the abutments. The palatal side of the bar is platinized by the galvanic method, as the gingival tissue tolerates the contact of platinum much better than that of gold. Although this method marks a considerable improvement over the Bryan device, the screws still have to bear a great deal of the force of mastication. The author therefore suggests another method of fixation of the transverse bar by soldering a piece of iridio-platinum of one millimeter thickness to the supporting end of the bar, and another one to the supporting abutment of the bridge, in the shape of two inverted U's. A screw is driven in linguo-buccal direction to prevent the bar and bridge from parting, the masticatory strain having no effect upon this screw. In this fashion the usefulness of the transverse bar of Bryan in extreme cases is fully safeguarded.

PERISCOPE.

Insulating Cement.—Two parts of Grecian pitch and one part of well-calcined gypsum are melted together. As long as the cement is warm it can be kneaded and worked plastically; when cold it can be turned in the lathe and polished.—*Bur.*

Hemostasis Without Medication.—After carefully removing all blood-clot, and washing the wound, a pellet of cotton that has been strongly singed over a Bunsen flame is pressed over the wound, renewed once or twice, and held in place either by maxillary pressure or a horizontal or vertical bandage.—PETIT, *Annales Dentaires.*

Soldering Paste.—A solution of waste sheet zinc cuttings in ordinary hydrochloric acid is diluted with an equal quantity of filtered water and ammonia solution added until the deposit is dissolved again. This zinc-chlorid-ammonia solution is mixed with thick starch paste, so that a mass of syrupy consistence is obtained, which can be advantageously used in soldering tin plate, iron, or brass.—*Bur.*

How to Overcome the Brittleness of Gold in Casting.—If gold other than pure be used in casting, it will be found to be brittle. This may be overcome by plunging the gold into a saturated solution of salt water, drying over a flame and melting and casting as usual.

The salt water acts as a flux and will overcome the brittleness, which is the objection to scrap gold in bridge work.—C. S. STARKWEATHER, *Dental Summary.*

A Method of Repairing a Shell Crown.—It frequently happens that a hole is worn through the occlusal surface of a gold crown, especially in cases when the opposing tooth is artificial, and when the cusp of the crown is too thin.

By the following method it is really surprising to see the extensive repairs that can be made without destroying the contour and occlusion of the crown: Remove the crown without slitting, if possible, though slitting is sometimes necessary. Remove the cement and cleanse the crown thoroughly in acid. Drill out thin edges and reshape the crown with pliers; replace it on the tooth to correct occlusion. Remove the crown, fill all openings with wax, allowing the wax to protrude slightly within the crown. Fill the crown with investing material. When the investment hardens, warm it slightly and pick out the wax. Pack gold foil in all openings, apply flux, and heat well. Solder may then be flowed over the gold foil, completely closing all openings, and when the crown is ground and polished, the repair is practically invisible.—F. C. FURNISS, *Dental Summary.*

Removing Wax Impressions for Inlays Without Distortion.—The knotted end of a stout silk thread is embedded in a small pellet of wax. After warming, this wax is compressed in the cavity with burnishers, care being taken to keep the thread in the center of the impression. After the wax model is completely built up and contoured, it is allowed to harden. A slight pull on the thread will remove the wax model from the cavity with a minimum of distortion.—H. LEGER-DOREZ, *Laboratoire et Progrès Dentaire.*

Platinum Base for Full Denture.—A platinum base should be not less than No. 30 gage. Its rim and ridge should be reinforced in a manner similar to that used in the reinforcement of the same parts of a gold base, using, of course, platinum instead of gold. The posterior edge of the base must necessarily be reinforced. A piece of 30-gage platinum one-quarter of an inch in width is securely soldered to the posterior border, leaving the anterior edge slightly tipped to allow an attachment for the porcelain.—W. D. N. MOORE, *Dental Review.*

How to Hasten the Shedding of Deciduous Teeth.—If for orthodontic treatment the removal of very loose deciduous teeth which are only retained by a tough ligament is desirable, and the child is too fretful to allow the extraction with forceps or even pincers, a very small and thin rubber ring slipped over the tooth gives a certain and quick result. The contracting rubber ring gradually slips down on the conically shaped crown of the deciduous tooth, and quickly causes the ligaments, which are the only hold of the loose tooth, to atrophy.—KOERBITZ, *Zeitschrift fuer Zahnaerztliche Orthopaedie.*

Soldering Fluid and Soldering Agent Substitute.—For this purpose an ammonia soap obtained by mixing finely powdered resin with strong ammonia solution is used. Of this soap there remains, on the place soldered, only the distributed resin after soldering. This process is particularly adapted for soldering copper wires together as electric conductors, the resin acting as an insulation.—*Bur.*

Purification of Wax.—After melting and filtering the wax through a straining cloth, it is boiled for twenty minutes in a solution of 12 gm. of oxalic acid in one liter of water. If treated in this manner, old wax becomes even purer than new. The addition of four drops of cinnamon oil to one kilogram makes the wax aseptic and more agreeable for the patient.—*Deutsche Zahnaerztliche Wochenschrift.*

Dermatol for Pyorrhea Alveolaris.—After a thorough cleansing of the teeth, a shred of cotton is wound around an iridioplatinum instrument, dipped into a solution of dermatol and vaselin, and introduced at the neck of the tooth between the gingiva and the tooth. This dressing must be frequently renewed. It is advisable to preserve the dermatol-vaselin in a glass bottle, which is slightly heated before using this agent in order to facilitate the saturation of the cotton fiber.—A. V. Ritter, *Bibliographie Dentaire.*

Non-Cohesive Gold Fillings.—The localities where excellent results are obtained by the use of non-cohesive foil are the following: All occlusal or other pit cavities, which in most cases should be filled entirely with non-cohesive foil; labio- and bucco-gingival cavities, which should be filled wholly or in part with non-cohesive foil, according to the conditions presenting; the gingival third of all approximal cavities, except in cases of large contour restorations in incisors, when it may be deemed best to start from the gingival side and complete the filling throughout with cohesive gold; against the labial enamel plate in incisors when that wall has been preserved for esthetic reasons, and to correct any little points of faulty adaptation while packing cohesive foil.

For filling simple occlusal or pit cavities the foil is prepared in ribbons and cylinders. A sheet of No. 4 Abbey's foil is cut into thirds, and these pieces are folded into ribbons a little wider than the depth of the cavity to be filled.

Some of these ribbons are rolled into cylinders varying in diameter according to the size of the cavity, and according to the place in the cavity which each is to occupy.

For folding the ribbons a steel, ivory, or bone spatula is used, the folding being done on a chamois pad, or a small board covered with several thicknesses of velvet. The cylinders are rolled upon a tiny-pointed, three-sided instrument like a Swiss broach, the end of the ribbon being engaged upon the point by pressing upon it with the tip of the finger while the instrument is given a turn or two, after which the ribbon is held between the thumb and index finger; when a cylinder has reached the desired size, the ribbon is cut off with the shears, and the ends of the cylinder are very slightly compressed with the foil carriers to keep it from unrolling. This work should be done with precision, as the more neatly the ribbons and cylinders are made the more satisfactorily they can be used.

Cylinders made in this way serve their purpose much better than ready-made ones, for they contain more gold than the latter, and consequently fill more rapidly, and can be made to exactly suit the case in hand.—H. B. Tileston, *Dental Summary.*

Removal of Pulps.—When we find it necessary to devitalize and remove a pulp from a distal cavity in a molar or bicuspid, the operation may be simplified by adopting the following method:

Remove all the decay possible near the pulp, and provide for retention for a permanent filling, such as amalgam or Aschers artificial enamel, preferably the latter. Apply the devitalizing paste and place over it a metal disk of sufficient strength to resist the pressure of inserting the permanent filling. Insert the filling and finish as you wish it to remain permanently. When the devitalizing agent has remained in the tooth the desired length of time, make a new opening into the pulp-chamber through the occlusal surface of the tooth far enough mesially to enable you to gain access to all the canals, and remove the devitalizing agent and all the decay that remained in the cavity. Then proceed with the treatments and canal-filling in the usual way.

You thus avoid the difficulty of trying to apply the required treatment through the almost inaccessible distal cavity. The occlusal cavity may be filled with a permanent filling after the root-canals have been successfully filled. In this way you will find it unnecessary to cut away the crown to such an extent as to weaken it, as would result if a mesial opening were made to gain access to the canals.—H. A. Cross, *Dental Review.*

Making a Wax Model for a Hollow Inlay.—After having taken the impression of the cavity and mounted it on a sprue wire or an old bur, apply the following apparatus: Take a rubber tube, 2 or 3 feet long, and mount on one end a hypodermic needle. Heat this needle over a Bunsen burner, keeping the open end of the tube in the mouth all the while. When the needle is hot, touch the lower or cavity surface of the wax model with the needle, and at the same time suck, thereby causing the wax to melt and to be drawn up into the needle. Heat the needle again, and exhale, thereby removing the wax from inside the needle. Repeat this procedure, until the desired hollow wax model is obtained, insuring a saving of gold.—*Articulator.*

Use of Vulcanite Scraps.—The surplus rubber usually left on the plate while packing a rubber denture seems to be generally saved only to be thrown away at some later time. To employ it advantageously, the following procedure is suggested. While the flasks are being warmed for closing, and while the rubber on the plate is yet soft, take one of your broken instruments, serrate the broken end, and pack some of the soft rubber around it. Mold it with the fingers approximately to any desired form, cover it with some soft plaster on tin foil, and leave it on top of the flask while vulcanizing. Besides thus having a test piece, you can make, by finishing and polishing the rubber piece at some spare moment, many useful instruments, such as different kinds of burnishers, spatulas, pumice carriers, pliers for removing gold from acid, etc.—M. A. Gottlieb, *Odontologist.*

Restoration of Interproximal Spaces.—In most cases where caries has destroyed the approximal surfaces, we find that the teeth, having lost their approximal supports, have moved from their normal positions, and the interproximal space is destroyed. In such cases restoration to the normal condition by separation is imperative. The condition is not confined to that particular point, but upon examination we find many teeth beyond to be affected, and the contact point lost, or there is not sufficient contact stress to prevent the continued ingress of stringy food substances.

Sufficient separation secured so as to restore the normal interproximal space and a good, well pronounced contact will also emphasize the contact points of the slightly displaced teeth, and the condition will be much improved all along the line.

In cases where the occlusal third of the crowns have been worn off, and with them the contact point, we find that the teeth have changed their positions; the interproximal spaces are destroyed, and the patient may experience constant interproximal trouble.

These conditions require a more complicated method of treatment. So many cases are presented, and with each a special treatment, that it is useless to prescribe further than to say that the contact points should be made stronger at all places where it seems most needed.

When we consider the great importance of the healthy interproximal space, we very reluctantly indeed extract a tooth from the perfect arch, for we realize well that this means not alone the loss of the tooth, but a serious impairment of the function on that entire side.—J. M. Prime, *Western Dental Journal.*

Vulcanizer Alarm.—An easily made and inexpensive alarm to indicate when the vulcanizer needs attention may be made as follows: Procure a cast-iron "buzzer," or, if a louder alarm is desired, an electric bell, and place this where it can be heard—it may be near the operating chair. Then select an alarm clock—one of the inexpensive round nickel-plated case clocks will answer the purpose; connect the clock and the buzzer or bell with a sufficient length of twisted incandescent lamp cord, separating the cords at the clock end, and remove from each a few inches of the insulation. Then to the winding key of the clock alarm fasten a piece of cardboard about an inch long, and to this secure the insulation-freed ends of the lamp cord in such a way that they are not electrically connected, and yet when the key is turned as the alarm runs down they will be twisted together, and thus make an electrical connection. At any convenient point connect one or two cells of a good dry battery to one of the strands of the lamp cord. The apparatus is now complete. Wind the alarm a few turns, set it at the time when vulcanization will be complete, and start the clock. As the alarm runs down, electrical connection is made, and the buzzer or bell indicates that time is up. If located near the chair a buzzer would not attract a patient's attention as would a bell. This was designed as an early-rising apparatus, the buzzer being wrapped in a napkin and placed under the pillow, waking the sleeper without rousing the household.—*Electrician and Mechanic.*

OBITUARY.

DR. J. Y. CRAWFORD.

DIED, April 5, 1910, at his home, corner Belmont and Acklen aves., Nashville, Tenn., JAMES YOUNG CRAWFORD, M.D., D.D.S., from an attack of angina pectoris.

Dr. Crawford had been subject to angina pectoris for several months. Though physically weak and a constant sufferer, he had continued to give attention to his professional duties until two days before his death, when his condition grew more and more critical, notwithstanding his receiving the best medical attention, and on the morning of the 5th at an early hour he lost consciousness, and all hope of his ultimate recovery was abandoned.

James Young Crawford was a native of Tennessee, his father being a prominent Methodist preacher of that state in ante-bellum days. He was born June 2, 1847. The larger portion of his childhood was spent in West Tennessee, but he had been a resident of Nashville for the past thirty years.

Though only fourteen years of age at the outbreak of the war, he entered the Confederate service, serving in the commissary department in Florida for the four years of that bloody period. At the close of the war he went to Bowling Green, Ky., where he studied dentistry under the preceptorship of one of the leading dentists of that city, later taking his degree at the University of Tennessee with the class of 1878. Following his graduation he located in McKenzie, where he practiced for several years. He then removed to Nashville, where the remainder of his life was spent. He soon took rank as a leader in his profession, and for years he stood without a superior as a dental surgeon in the South.

In the death of Dr. Crawford the dental world has received a very hard blow, not only on account of his ability, but probably more so in that he imbued all who came in contact with him with the extraordinary enthusiasm which he felt for his work. He was an eloquent speaker, and at any meeting he attended Dr. Crawford was sure to be called on to make an address. His friends in the North always spoke of him as the "eloquent Southerner." He was a self-made man, not in the sense that this expression is generally used, for he was a man of gentle birth, but what he accomplished was done through his own efforts. It was owing to ceaseless devotion to his work that he rose to the high place which he occupied at the time of his death. He was a man of influence in his profession, in the social world, and in political life.

Dr. Crawford was the last surviving member of the committee of five prominent dentists who organized the International Dental Congress during the World's Fair at Chicago. He was always a prominent figure in his profession, taking an active interest in its various organizations, and was several times a delegate to the American Dental Association.

He was a good citizen. Possessed of a genial disposition, he had won a large circle of friends not only in the profession which he so long adorned, but among the people generally, who admired him for his charming personality and for the deep interest he ever manifested in the city's welfare. He was a member of the Methodist Church, holding church membership in McKendree at the time of his death. When residing in the West End he was for many years one of the officials of the West End Methodist Church. He was ever ready to contribute liberally of his means to the promotion of the church's work.

In 1885 Dr. Crawford married Miss Louise Haggard, daughter of the late Dr. W. D. Haggard. He is survived by his wife and three children.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS: May, June, and July.

MAY.

ALABAMA DENTAL ASSOCIATION. Mobile. Four days: May 10th to 13th.

CANADIAN DENTAL ASSOCIATION AND ONTARIO DENTAL SOCIETY. Toronto. Four days: May 31st to June 3d.

ILLINOIS STATE DENTAL SOCIETY. Springfield. Four days: May 17th to 20th.

INDIANA STATE DENTAL ASSOCIATION. Indianapolis. Three days: May 17th to 19th.

IOWA STATE DENTAL SOCIETY. Des Moines. Three days: May 3d to 5th.

KANSAS STATE DENTAL ASSOCIATION. Topeka. Three days: May 17th to 19th.

KENTUCKY STATE DENTAL ASSOCIATION. Louisville. Three days: May 26th to 28th.

LAKE ERIE (PA.) DENTAL ASSOCIATION. Cambridge Springs. Three days: May 17th to 19th.

LEBANON VALLEY DENTAL ASSOCIATION. Reading. Two days: May 10th and 11th.

LOUISIANA STATE DENTAL SOCIETY. New Orleans. Three days: May 9th to 11th.

MISSISSIPPI DENTAL ASSOCIATION. Jackson. Three days: May 24th to 26th.

MISSOURI STATE DENTAL ASSOCIATION. St. Louis. Four days: May 23d to 26th.

MONTANA STATE DENTAL SOCIETY. Great Falls. Two days: May 6th and 7th.

NATIONAL DENTAL ASSOCIATION, SOUTHERN BRANCH, AND TEXAS STATE DENTAL ASSOCIATION. Houston. Four days: May 3d to 6th.

NEBRASKA STATE DENTAL SOCIETY. Omaha. Three days: May 17th to 19th.

NEW HAMPSHIRE AND VERMONT DENTAL SOCIETIES. Rutland, Vt. Four days: May 17th to 20th.

NEW YORK STATE DENTAL SOCIETY. Albany. Three days: May 5th to 7th.

NORTH DAKOTA DENTAL ASSOCIATION. Fargo. Two days: May 10th and 11th.

ONTARIO DENTAL SOCIETY AND CANADIAN DENTAL ASSOCIATION. Toronto. Four days: May 31st to June 3d.

SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA. Harvey's Lake. Three days: May 24th to 26th.

TENNESSEE STATE DENTAL ASSOCIATION. Nashville. May 17th to 19th.

TEXAS STATE DENTAL ASSOCIATION AND NATIONAL DENTAL ASSOCIATION, SOUTHERN BRANCH, Houston. Four days: May 3d to 6th.

VERMONT AND NEW HAMPSHIRE DENTAL SOCIETIES. Rutland, Vt. Four days: May 17th to 20th.

JUNE.

AMERICAN MEDICAL ASSOCIATION, SECTION ON STOMATOLOGY. St. Louis, Mo. Four days: June 7th to 10th.

CALIFORNIA STATE DENTAL ASSOCIATION. San Francisco. Four days: June 22d to 25th.

DISTRICT OF COLUMBIA DENTAL SOCIETY AND MARYLAND STATE DENTAL ASSOCIATION. Baltimore. Three days: June 9th to 11th.

FLORIDA STATE DENTAL SOCIETY. St. Augustine. Three days: June 23 to 25th.

GEORGIA STATE DENTAL SOCIETY. Atlanta. Three days: June 14th to 16th.

MAINE DENTAL SOCIETY. Rangeley. Three days: June 22d to 24th.

MARYLAND STATE DENTAL ASSOCIATION AND DISTRICT OF COLUMBIA DENTAL SOCIETY. Baltimore. Three days: June 9th to 11th.

MASSACHUSETTS DENTAL SOCIETY. Springfield. Three days: June 14th to 16th.

MICHIGAN STATE DENTAL SOCIETY. Detroit. Three days: June 13th to 15th.

NORTHERN OHIO DENTAL ASSOCIATION. Toledo. Three days: June 7th to 9th.

PENNSYLVANIA STATE DENTAL SOCIETY. Harrisburg. Three days: June 28th to 30th.

SOUTH DAKOTA STATE DENTAL SOCIETY. Pierre. Two days: June 9th and 10th.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION. Los Angeles. Three days: June 16th to 18th.

SOUTH CAROLINA STATE DENTAL ASSOCIATION. Glenn Springs. Four days: June 28th to July 1st.

SOUTHERN WISCONSIN DENTAL ASSOCIATION. Janesville. Two days: June 2d and 3d.

Tennessee State Dental Association. Nashville. Three days: May 17th to 19th.

JULY.

National Dental Association. Denver, Colo. Four days: July 19th to 22d.

National Association of Dental Examiners. Denver, Colo. July 25th.

National Association of Dental Faculties. Denver, Colo. July 25th.

Delta Sigma Delta Fraternity. Denver, Colo. July 18th.

Psi Omega Dental Fraternity. Denver, Colo. July 18th.

New Jersey State Dental Society. Asbury Park. Four days: July 20th to 23d.

North Carolina Dental Society. Wrightsville. Four days: July 13th to 16th.

Virginia State Dental Association. Staunton. July 20th to 22d.

Wisconsin State Dental Society. Ashland. Four days: July 12th to 15th.

Examiners' Meetings.

Alabama Board of Examiners. Mobile. May 9th.

Arkansas Board of Examiners. Little Rock. June 6th and 7th.

Connecticut Dental Commissioners. Hartford. June 16th to 18th.

Florida Board of Examiners. St. Augustine. June 23d to 25th.

Illinois Board of Examiners. Chicago. June 13th.

Indiana Board of Examiners. Indianapolis. June 13th to 16th.

Iowa Board of Examiners. Iowa City. June 6th.

Maine Board of Examiners. Portland. July 5th.

Maryland Board of Examiners. Baltimore. May 19th and 20th.

Massachusetts Board of Registration. Boston. June 1st to 3d.

Michigan Board of Examiners. Ann Arbor. June 20th to 25th.

Minnesota Board of Examiners. Minneapolis. June 6th to 9th.

Mississippi Board of Examiners. Jackson. May 17th.

Nebraska Board of Examiners. Lincoln. June 27th.

New Hampshire Board of Registration. Manchester. June 1st to 3d.

New Jersey Board of Registration. Trenton. July 5th to 7th.

Ohio State Dental Board. Columbus. June 21st to 24th.

Pennsylvania Board of Examiners. Philadelphia and Pittsburg. June 8th to 11th.

Rhode Island Board of Registration. Providence. June 28th to 30th.

South Carolina Board of Examiners. Glenn Springs. June 24th to 28th.

South Dakota Board of Examiners. Sioux Falls. July 6th to 8th.

Texas Board of Examiners. Houston. June 13th.

Virginia Board of Examiners. Richmond. June 14th.

Washington Board of Examiners. Seattle. May 26th.

West Virginia Board of Examiners. Wheeling. June 8th to 10th.

Wisconsin Board of Examiners. Milwaukee. June 20th.

DENTAL HYGIENE COUNCIL OF NEW YORK CITY.

Dental Hygiene Conference and Exhibit.

A dental hygiene conference and exhibit will be held at the Metropolitan Building, New York city, May 12 to 18, 1910, under the auspices of the Dental Hygiene Council of New York city, with the co-operation of the Children's Aid Society, the Association for Improving the Condition of the Poor, and the Charity Organization Society. Exhibit open every day, including Sunday May 15th.

Arrangements are being made for the holding of a stereopticon lecture on dental hygiene every afternoon of the week at four o'clock, and twice on Saturday for school children.

The conferences will be held evenings, and will be addressed by well-known speakers such as Woods Hutchinson, C. Ward Crampton, J. J. Cronin, S. Josephine Baker, Jane Robbins, Roy Smith Wallace, Wm. H. Allen, etc.

The exhibit and all meetings are open to the public. It is hoped that every dentist in the vicinity of New York will try to visit the exhibit and be present at as many of the evening meetings as possible, also that they will urge such attendance upon their patients.

Programs may be had later upon application.

Arthur H. Merritt, *Chairman*,
59 West 46th st., New York city.

The Meetings at Denver.

COMMUNICATION FROM THE PUBLICITY COMMITTEE, N. D. A.

The National Dental Association, the National Association of Dental Examiners, the National Association of Dental Faculties, the American Society of Orthodontists, the Delta Sigma Delta Fraternity, and the Psi Omega Dental Fraternity, all meet at Denver during July.

The Brown Palace Hotel will be the headquarters for the National Dental Association, the American Society of Orthodontists and the Psi Omega Dental Fraternity; the Savoy Hotel will be the headquarters for the National Dental Association, the National Association of Dental Examiners and the Delta Sigma Delta Fraternity, and the Shirley Hotel will be the headquarters for the National Association of Dental Faculties. These hotels are all located at the intersection of Seventeenth st. and Broadway. Street-cars connect them with the Union Depot, which is at the foot of Seventeenth st.



A GLIMPSE OF DENVER.
(Population over 200,000. One mile above sea level, in sight of perpetual snow.)

The attendance at this meeting will amply repay all outlay of time and money. The meetings promise to be first-class, and the opportunity to visit Colorado and the "Queen City of the Plains" is a most favorable one. While Denver is a resort for all seasons of the year, it is especially attractive in the summer. A beautiful city in itself, Denver is in every way fitted to care for conventions.

There are many first-class hotels, rooming houses, and restaurants. Accommodations may be had for $1.00 per day and up for room without bath and $2.00 per day and up for room with bath. A fair average rate will be about $2.00 and $3.00 for one and two persons respectively in room without bath, and $2.50 to $4.00 with bath. Good restaurants and cafés are to be found throughout the business section.

The Auditorium, where the meeting will be held, is a well-ventilated, fireproof building, arranged especially for the use of conventions, and will accommodate all departments of the meeting, including the exhibits—an ideal arrangement which will make it possible to profit by every feature of the meeting with the minimum expenditure of energy.

A large and interesting manufacturers' exhibit is assured. The following firms have already made reservation of space:

S. S. White Dental Mfg. Co.
Harvard Co.
A. C. Clark Co.
Dentists' Supply Co.
Eli Lilly & Co.
Horlick's Malted Milk Co.
Kolynos Co.
Chas. H. Phillips Chemical Co.
Ritter Dental Mfg. Co.
W. A. Ivory.



THE NEW AUDITORIUM.
(Where the meeting will be held.)

W. V-B. Ames Co.
Apothecaries Co.
James J. Ottinger.
Lambert Pharmacal Co.
Denver Chemical Co.
Pelton & Crane.
Lee Smith & Son Co.
Dental Protective Supply Co.
Mulford & Co.
Columbus Dental Mfg. Co.

Round-trip railroad rates to Colorado common points during the summer season, June 1st to September 30th, final return limit October 31st, prevail about as follows: Chicago, $30.00; St. Louis, $25.00; Omaha and Kansas City, $17.50.

N. B.: It is not generally known that these tickets can be purchased through to Colorado Springs and Pueblo at the same rate as to Denver. By doing this the tourist can visit the numerous points of interest south of Denver (Colorado Springs, Manitou, the Garden of the Gods, Pike's Peak region, Pueblo, etc.), without any additional expense for transportation. These tickets allow unlimited stopovers, within final limit, in both directions at Denver and Colorado Springs, giving all the time desired to attend the convention, take in the side trips, etc. Tickets may be validated for return passage at either of the points mentioned, leaving it optional with the purchaser whether the ticket be used south of Denver.

Denver is the gateway to the wonderful mountain scenery of Colorado, the Switzerland of America. The side trips out of Denver are numerous and varied, in character, time, and expense.

For detailed information, vacation suggestions, estimates, etc., write

Dr. H. F. Hoffman,
Ch'man Publicity Committee, N. D. A.,
612 California bldg., Denver, Colo.

NATIONAL DENTAL ASSOCIATION MEETING.

Denver, Col., July 19–22, 1910.

Officers.

BURTON LEE THORPE, St. Louis, Mo., *President.*

W. T. CHAMBERS, Denver, Col., *Vice-president—West.*

C. W. RODGERS, Dorchester, Mass., *Vice-president—East.*

T. P. HINMAN, Atlanta, Ga., *Vice-president—South.*

H. C. BROWN, Columbus, Ohio, *Corresponding Secretary.*

CHARLES S. BUTLER, Buffalo, N. Y., *Recording Secretary.*

A. R. MELENDY, Knoxville, Tenn., *Treasurer.*

Executive Committee.

J. D. PATTERSON, *Chairman,* Kansas City, Mo.

First Division—Committee on Arrangements.

J. D. PATTERSON, Kansas City, Mo.
C. M. WORK, Ottumwa, Iowa.
W. G. MASON, Tampa, Fla.

Second Division—Committee on Credentials and Auditing.

V. H. JACKSON, New York, N. Y.
H. B. MCFADDEN, Philadelphia, Pa.
M. F. FINLEY, Washington, D. C.

Third Division—Committee on Voluntary Essays.

L. MEISBURGER, Buffalo, N. Y.
F. B. KREMER, Minneapolis, Minn.
C. J. GRIEVES, Baltimore, Md.

Executive Council.

H. J. BURKHART, *Chairman,* Batavia, N. Y.
A. H. PECK, Chicago, Ill.
B. HOLLY SMITH, Baltimore, Md.
W. E. BOARDMAN, Boston, Mass.
C. L. ALEXANDER, Charlotte, N. C.
BURTON LEE THORPE, C. S. BUTLER (*ex-officio* members.)

Organization of Sections.

SECTION I.

Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

GEO. H. WILSON, *Chairman,* Cleveland, Ohio.

STANLEY L. RICH, *Vice-chairman,* Nashville, Tenn.

B. FRANK GRAY, *Sec'y,* Los Angeles, Cal.

SECTION II.

Operative Dentistry, Nomenclature, Literature, Dental Education, and Allied Subjects.

L. L. BARBER, *Chairman,* Toledo, Ohio.
F. I. SHAW, *Vice-ch'man,* Seattle, Wash.
F. L. PLATT, *Secretary,* San Francisco, Cal.

SECTION III.

Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects.

WM. CARR, *Chairman,* New York, N. Y.
L. F. LUCKIE, *Vice-ch'n,* Birmingham, Ala.
RICHARD SUMMA, *Secretary,* St. Louis, Mo.

Clinics.

F. O. HETRICK, *Chairman,* Ottawa, Kans.
HOWARD S. SEIP, *Vice-ch'n,* Allentown, Pa.
L. A. CRUMLEY, *Sec'y,* Birmingham, Ala.
J. E. CHACE, Ocala, Fla.
GEORGE E. SAVAGE, Worcester, Mass.
J. J. SARRAZIN, New Orleans, La.
H. H. SULLIVAN, Kansas City, Mo.
A. O. ROSS, Columbus, Ohio.
J. D. TOWNER, Memphis, Tenn.
J. B. HOWELL, Paducah, Ky.
L. B. MCLAURIN, Natchez, Miss.
J. H. LORENZ, Atlanta, Ga.
F. L. HUNT, Asheville, N. C.
J. G. FIFE, Dallas, Tex.
W. G. DALRYMPLE, Ogden, Utah.
R. D. ROBINSON, Los Angeles, Cal.
C. S. IRWIN, Vancouver, Wash.
F. R. HENSHAW, Indianapolis, Ind.
H. G. NOTTAGE, Portland, Ore.
F. L. WRIGHT, Wheeling, W. Va.
R. L. SIMPSON, Richmond, Va.
A. P. BURKHART, Buffalo, N. Y.
S. W. BOWLES, Washington, D. C.
T. M. HAMPTON, Helena, Mont.
J. BRUCE PERRIN, Des Moines, Ia.

Local Committee of Arrangements.

E. R. WARNER, *Chairman,* Denver, Col.
H. A. FLYNN, *Vice-chairman,* Denver, Col.
W. P. SMEDLEY, Denver, Col.
W. A. BRIERLEY, Denver, Col.
W. W. FLORA, Colorado Springs, Col.
W. T. CHAMBERS (*ex-officio*), Denver, Col.

Chairmen of Sub-Committees.

Publicity—H. F. HOFFMAN, Denver, Col.
Clinics—A. W. STARBUCK, Denver, Col.
Exhibits—JOHN STEELE, Denver, Col.
Entertainment—I. C. BROWNLIE, Denver, Col.

[At Denver.]

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The twenty-eighth annual session of the National Association of Dental Examiners will be held at the new Savoy Hotel, Denver, Col., commencing Monday, July 25, 1910, at 10 A.M. The rates will be $2.00 per day for one and $3.00 per day for two persons in room, European plan; large room for one or two with private bath $4.00 and $5.00 per day. Meeting and committee rooms at the service of the association, free, and every accommodation extended.

An early mail reservation is requested, the time being the busy season. A full representation from every state in the United States is earnestly desired.

J. J. Wright, *President*,
Wells bldg., Milwaukee, Wis.
Chas. A. Meeker, *Sec'y*,
29 Fulton st., Newark, N. J.

[At Denver.]

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The National Association of Dental Faculties will meet at the Hotel Shirley, Denver, Colo., Monday, July 25, at 10 o'clock A.M. The Executive Committee will meet to consider business of the association at 9 o'clock A.M., on the same day.

The Hotel Shirley is connected by bridge with the Savoy, where the meeting of the National Association of Dental Examiners takes place on the same date.

The rates will be $2.00 per day for one and $3.00 for two persons in one room, European plan. Large rooms for one or two persons with private bath, $4.00 and $5.00 per day.

B. Holly Smith, *Ch'man Ex. Com.*,
Baltimore, Md.

[At Denver.]

DELTA SIGMA DELTA FRATERNITY.

The twenty-sixth annual meeting of the Supreme Chapter of Delta Sigma Delta Fraternity will convene at the Hotel Savoy, Denver, Colo., Monday, July 18th, at 10 A.M.

R. Hamill D. Swing, *Supreme Scribe.*

NATIONAL DENTAL ASSOCIATION—SOUTHERN BRANCH

AND THE

TEXAS STATE DENTAL ASSOCIATION.

The thirteenth annual meeting of the Southern Branch of the National Dental Association will be held in Houston, Texas, Wednesday, May 4, 1910, continuing in session three days. The association has accepted the invitation of the Texas State Dental Association to meet conjointly with them and as their guests.

The officers and members are actively at work, and a most instructive program is being arranged. A preliminary program will be announced later.

Carroll H. Frink, *Recording Sec'y*,
301 Masonic Temple, Jacksonville, Fla.

The annual meeting of the Texas State Dental Association will be held at Houston, Texas, May 3, 1910. On May 4, 5, and 6, the association will hold a joint meeting with the Southern Branch of the National Dental Association, at the same place. The profession is cordially invited to visit Texas on this occasion.

J. G. Fife, *Sec'y*,
Dallas, Texas.

AMERICAN MEDICAL ASSOCIATION.

Section on Stomatology.

Following is the program of the American Medical Association, Section on Stomatology, for the annual session at St. Louis, Mo., June 7 to 10, 1910:

1. Chairman's Address. Thomas L. Gilmer, Chicago.

2. "Growth and Regeneration of the Bones of the Face." Stewart L. McCurdy, Pittsburg, Pa.

3. "The Surgical Principles of Hare-lip Operations." George V. I. Brown, Milwaukee, Wis.

4. "A Study of the Repair of Cementum." M. H. Fletcher, Cincinnati, Ohio.

5. "Systemic Conditions in Relation to Oral Symptoms: Pain, Fetor, and Sepsis." Vida A. Latham, Chicago.

6. "The Teeth as a Factor in Pathognesis." Herbert A. Potts, Chicago.

7. "Septicemia of Dental Origin." Arthur R. Dray, Philadelphia, Pa.

8. "The Mouth Lesions of Syphilis and the Dangers Arising from Them." Charles M. Whitney, Boston, Mass.

9. "The Relation of Pathologic Conditions of the Mouth and Systemic Diseases." Henry R. Harrower, Chicago.

10. "The Value of Vaccines in Oral Surgery." James E. Power, Providence, R. I.

11. "The Teeth and Alveolar Processes as Points of Entrance for the Tubercle Bacillus." Frederick Moorehead, Chicago.

12. "The Close Relations between the Dentist and the Physician." Bertha E. Bush, Chicago.

13. "A Review of the References to Oral Conditions in a Number of Standard Textbooks on Surgery." Arthur D. Black, Chicago.

14. "Conservation of General Health in Children through Overcoming the Inclination toward Nasal Stenosis by Means of Widening the Maxillary Arch." Nelson Black, Milwaukee, Wis.

15. "The Influence of Widening the Palatal Arch on the Nose." Lee Wallace Dean, Iowa City, Iowa.

16. "The Relation of the Teeth to the Development of the Face." Fred. Noyes, Chicago.

17. "How Shall the Stomatologist be Educated?" Eugene S. Talbot, Chicago.

18. "Future Stomatological Education." M. L. Rhein, New York city, N. Y.

THOMAS L. GILMER, *Chairman*,
EUGENE S. TALBOT, *Sec'y*.

AMERICAN DENTAL SOCIETY OF EUROPE.

AT the thirty-seventh annual meeting of the American Dental Society of Europe, held at Paris, France, March 25, 26, and 28, 1910, the following officers were elected for the ensuing year: Dr. W. M. Cooper, Frankfurt a. M., Germany, president; Dr. F. F. Robinson, Paris, France, vice-president; Dr. T. G. Patterson, Geneva, Switzerland, honorary secretary; Dr. E. Frank Day, London, England, honorary treasurer; Dr. C. F. Bödecker, Berlin, Germany, microscopist.

The next meeting of the society will be held in Dresden the first week in August 1911.

T. G. PATTERSON, *Hon. Sec'y*,
2 Quai des Eaux-Vives, Geneva, Switzerland.

MISSISSIPPI DENTAL ASSOCIATION.

THE seventeenth annual meeting of the Mississippi Dental Association will be held in Jackson, in the Senate chamber of the Capitol, May 24 to 26, 1910. All ethical dentists are invited.

L. B. PRICE, *Sec'y*,
Corinth, Miss.

LAKE ERIE (PA.) DENTAL ASSOCIATION.

THE forty-seventh annual meeting of the Lake Erie Dental Association will be held at the Bartlett Hotel, Cambridge Springs, Pa., May 17, 18, and 19, 1910. All reputable practitioners are cordially invited to attend.

V. H. MCALPIN, *Sec'y*.

ILLINOIS STATE DENTAL SOCIETY.

THE forty-sixth annual meeting of the Illinois State Dental Society will be held in Springfield, May 17, 18, 19, and 20, 1910.

In addition to an especially good list of essays and clinics, an unusually attractive supply exhibit is being planned.

J. F. F. WALTZ, *Sec'y*,
Decatur, Illinois.

ATLANTA DENTAL COLLEGE.

ALUMNI ASSOCIATION.

THE alumni of the Atlanta Dental College will hold its second annual meeting with its day of clinics in the operatory of the college building, May 7, 1910. Commencement exercises at The Grand the same evening. On Friday evening a banquet will be served, to which all alumni are cordially invited.

C. N. HUGHES, *Sec'y*.

ODONTOGRAPHIC SOCIETY OF WEST PHILADELPHIA.

THE next meeting of the Odontographic Society of West Philadelphia will be held Monday, May 2, 1910, at 8 P.M., in the amphitheater of Dental Hall, University of Pennsylvania. At this meeting Dr. Thomas E. Weeks will read a paper on "The Improvement of the Interproximal Space."

R. R. PARKS, *Sec'y*.

VERMONT AND NEW HAMPSHIRE DENTAL SOCIETIES.

JOINT MEETING.

THE Vermont and New Hampshire Dental Societies will hold a joint meeting at Rutland, Vt., May 17 to 20, 1910.

HARRY F. HAMILTON, *Sec'y*,
Newport, Vt.

KANSAS STATE DENTAL ASSOCIATION.

THE next annual meeting of the Kansas State Dental Association will be held in Topeka, Kans., May 17, 18, and 19, 1910.

EDWARD BUMGARDNER, *President.*
H. W. FESSENDEN, *Sec'y.*

LEBANON VALLEY (PA.) DENTAL ASSOCIATION.

THE thirty-fifth annual meeting of the Lebanon Valley Dental Association will be held in Red Men's Hall, 831 Walnut st., Reading, Pa., May 10 and 11, 1910.

CLARENCE B. GRIM,
Ch'man Ex. Committee.

IOWA STATE DENTAL SOCIETY.

THE forty-eighth annual meeting of the Iowa State Dental Society will be held at Des Moines, May 3, 4, and 5, 1910. Besides an especially strong program, plans are being made for a large dental manufacturers' exhibit. Display space free of charge.

W. G. CRANDALL, *Sec'y*,
Spencer, Iowa.

UNIVERSITY OF CALIFORNIA, COLLEGE OF DENTISTRY.

ALUMNI ASSOCIATION.

THE annual reunion and clinic of the alumni association of the College of Dentistry, University of California, will be held on Monday, Tuesday, and Wednesday, May 16 to 18, 1910.

The clinics will be given at the Infirmary of the college of dentistry on Monday, May 16th. Tuesday and Wednesday will be given over to the general celebration of the Golden Jubilee of the university and the commencement exercises.

NEW YORK STATE DENTAL SOCIETY.

THE forty-second annual meeting of the Dental Society of the State of New York will be held in Albany, Thursday, Friday, and Saturday, May 5, 6, and 7, 1910. Sessions will be held in Odd Fellows Hall, and will convene promptly at 2 P.M., Thursday, May 5th. There will be no evening session on Friday, May 6th. All day Saturday will be devoted to clinics, when all that is latest and best will be shown. A large exhibit also is assured.

Special rates have been secured at the various hotels. These rates will be quoted in the program when issued. Special railroad rate of one and three-fifths fare has been arranged with the Trunk-line Association. Ask for a certificate, not a receipt, when you purchase your ticket. Without it you cannot have the benefit of the reduced rate on the return trip.

Exhibitors desiring space will please apply to Dr. O. J. Gross, Schenectady, N. Y.

PROGRAM.

President's Address. Dr. B. C. Nash.

Correspondent's Report. Dr. H. C. Ferris.

Report of Executive Council. Dr. A. C. Rich.

Report of Committee on Practice. Dr. A. H. Merritt.

Report of Committee on Scientific Research. Dr. W. B. Dunning.

Essays.

"Progress in Dental Science and Art." Dr. N. S. Jenkins, Dresden.

"Elements of Success in Practice." Dr. J. Leon Williams, London.

"Sectional Inlays." Dr. S. G. Perry, New York.

"What Constitutes a *Cure* in Pyorrhea Alveolaris?" Dr. R. G. Hutchinson, New York.

B. C. NASH, *President*,
ELLISON HILLYER, *Sec'y*,
Brooklyn.

TENNESSEE STATE DENTAL ASSOCIATION.

THE Tennessee State Dental Association will hold its forty-third annual meeting at Nashville, Tenn., May 17, 18, and 19, 1910. All ethical practitioners are invited to meet with us.

J. L. MANIRE, *Sec'y*,
Memphis, Tenn.

ALABAMA DENTAL ASSOCIATION.

The next annual meeting of the Alabama Dental Association will be held in Mobile, Ala., May 10, 11, 12, and 13, 1910. All ethical dentists are cordially invited.

E. W. Patton, *Sec'y*,
Selma, Ala.

NORTH DAKOTA DENTAL ASSOCIATION.

The annual meeting of the North Dakota Dental Association will be held in Fargo, May 10 and 11, 1910.

This promises to be a great meeting. An unusually interesting and profitable program is being arranged, and a cordial invitation is extended to all ethical members of the profession.

F. A. Bricker, *Sec'y*,
61 Broadway, Fargo, N. D.

LOUISIANA STATE DENTAL SOCIETY.

Change of Date of Meeting.

The thirty-second annual meeting of the Louisiana State Dental Society will be held at the Grunewald Hotel, in New Orleans, La., May 9, 10, and 11, 1910.

A cordial invitation is extended to all who attend the Southern Branch of the N. D. A., which will convene in Houston, Texas, May 4th to 6th. Special railroad rates all the way to New Orleans; also special rates at the Hotel Grunewald, our headquarters and meeting-place.

Stop over to visit historic New Orleans, as well as enjoy the famous Creole cooking.

J. A. Gorman, *Ch'm Ex. Com.*,
1108 Maison Blanche Bldg., New Orleans, La.

INDIANA STATE DENTAL ASSOCIATION.

The program for our fifty-second annual meeting, at Indianapolis, promises to be an unusually interesting and profitable one. Every effort has been put forth to secure the very best talent in the profession for the essays and clinics. Among the essayists are Drs. R. Ottolengui, New York city; J. H. Prothero, Chicago; E. C. Mills, Columbus, Ohio; J. C. Carmichael, Milwaukee, Wis.; George Wood Clapp, New York city, and others from our own state.

Dr. W. E. Kennedy, supervisor of clinics, has secured over fifty clinicians, and a new feature this year will be a clinic each afternoon of the session.

Please notice that the meeting this year will be held in May—17th to 19th. Mark off these dates now.

Otto U. King, *Sec'y*,
Huntington, Ind.

MONTANA STATE DENTAL SOCIETY.

The next meeting of the Montana State Dental Society will be held in Great Falls, May 6 and 7, 1910. Dr. J. H. Prothero of Chicago, and Dr. J. W. Ritter of Charlestown, Ill., will give clinics.

W. H. Barth,
Ch'man Ex. Committee.

SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA.

The forty-seventh annual meeting of the Susquehanna Dental Association of Pennsylvania will be held at Hotel Oneonta, Harvey's Lake, Luzerne co., Pa., Tuesday, Wednesday, and Thursday, May 24, 25, and 26, 1910. Harvey's Lake is a beautiful mountain resort twelve miles from Wilkes-Barre, and the Oneonta is a modern summer hotel.

An excellent program of papers and clinics is being prepared, and among those who will participate are Drs. V. H. Jackson of New York, E. C. Kirk, Louis Jack, E. T. Darby, H. C. Register, J. G. Lane, Philadelphia, and C. S. Van Horn, Bloomsburg.

Exhibitors desiring space should address Dr. F. L. Davenport, N. Franklin st., Wilkes-Barre. All other communications should be sent to Dr. A. E. Bull, S. Washington st., Wilkes-Barre.

All ethical practitioners are cordially invited to consider this notice an invitation to be our guest for these three days. Mark off the days now, and come.

A. E. Bull,
E. J. Donnegan,
W. E. Davis,
Publicity Committee.

KENTUCKY STATE DENTAL ASSOCIATION.

The forty-first annual meeting of the Kentucky State Dental Association will be held in Louisville, May 26, 27, and 28, 1910.

An unusually interesting and profitable program is being arranged for this year, and a cordial invitation is extended to all ethical members of the profession.

W. M. Randall, *Sec'y*,
Cor. Brook and Broadway, Louisville, Ky.

MISSOURI STATE DENTAL ASSOCIATION.

The forty-fifth annual meeting of the Missouri State Dental Association will convene in St. Louis, May 23, 24, 25, and 26, 1910. This meeting will be the greatest in the history of the association. The Committee on Reorganization will have their duty performed by that time, and the attendance will be double that of former years.

The papers will not be many, but of the very best. Drs. G. V. Black and J. V. Conzett will be the guests of the society, which assumes that something worth while will be going on.

The clinics will be very extensive, but bring yours along; it will help someone.

Mark off the dates.

J. F. Wallace, *Sec'y*,
Canton, Mo.

MARYLAND STATE DENTAL ASSOCIATION AND DISTRICT OF COLUMBIA DENTAL SOCIETY.

A joint meeting of the District of Columbia Dental Society and the Maryland State Dental Association will be held in Baltimore, at the Dental Department of the Baltimore Medical College, June 9, 10, and 11, 1910.

A cordial invitation is extended to all ethical members of the profession to attend and participate. Exhibitors requiring space are requested to communicate with Dr. Geo. R. Carter, 712 N. Eutaw st., Baltimore, Md.

For further particulars address

H. M. Schooley,
1110 F st., Washington, D. C.
F. F. Drew,
701 N. Howard st., Baltimore, Md.

GEORGIA STATE DENTAL SOCIETY.

The forty-fourth annual meeting of the Georgia State Dental Society will be held in Atlanta, Ga., June 14, 15, and 16, 1910.

DeLos L. Hill, *Sec'y*,
Atlanta, Ga.

SOUTH DAKOTA STATE DENTAL SOCIETY.

The annual meeting of the South Dakota State Dental Society will be held at Pierre, S. D., June 9 and 10, 1910. All reputable practitioners are cordially invited.

E. J. Schnaidt, *Sec'y*,
Menno, S. D.

MICHIGAN STATE DENTAL SOCIETY.

The next annual meeting of the Michigan State Dental Society will be held in Detroit, Mich., June 13, 14, and 15, 1910.

Don M. Graham, *Sec'y*,
Detroit, Mich.

PENNSYLVANIA STATE DENTAL SOCIETY.

The Pennsylvania State Dental Society will hold its next annual meeting in the Board of Trade Building, 112-116 Market st., Harrisburg, June 28, 29, and 30, 1910.

Luther M. Weaver, *Recording Sec'y*,
Philadelphia, Pa.

CANADIAN DENTAL ASSOCIATION.

The bi-annual meeting of the National Dental Association of Canada will be held in Toronto, May 31, June 1, 2, and 3, 1910,—papers and clinics. We invite our American brethren, and offer them all the privileges of the convention. Delightful temperature in June. Toronto is three hours from Buffalo, four from Muskoka or Georgian Bay, one night from the famous Cobalt, and six hours from the Thousand Islands of the St. Lawrence. Come and join us. Single fare rates, upon certificate plan, over all of trunk-line territory.

Geo. W. Grieve, *Sec'y Ex. Com.*,
2 Bloor st., East Toronto, April 7, 1910.

MAINE DENTAL SOCIETY.

The next meeting of the Maine Dental Society will be held June 22 to 24, 1910, at the Rangeley Lake House, Rangeley, Me.

I. E. Pendleton, *Sec'y.*

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

The sixteenth annual meeting of the Southern Wisconsin Dental Association will be held at Janesville, Wis., June 2 and 3, 1910.

C. W. Collver, *Sec'y,*
Clinton, Wis.

NORTH CAROLINA DENTAL SOCIETY.

The thirty-sixth annual meeting of the North Carolina State Dental Society will be held July 13 to 16, 1910, at Wrightsville, N. C. The Seashore Hotel will be the headquarters.

Arthur H. Fleming, *Sec'y,*
Louisburg, N. C.

CALIFORNIA STATE DENTAL ASSOCIATION.

Change of Date of Meeting.

The thirty-seventh annual meeting of the California State Dental Association will be held in San Francisco, June 22 to 25, 1910. An interesting program of papers and clinics is being arranged, and it will be one of the most instructive meetings ever held on the coast. Eastern friends are invited to attend on their way to Denver.

C. E. Post, *Sec'y,*
San Francisco, Cal.

SOUTH CAROLINA STATE DENTAL SOCIETY.

The South Carolina State Dental Society will hold its fortieth annual meeting at Glenn Springs (near Spartanburg), S. C., beginning June 28 and adjourning July 1, 1910. An attractive program will be presented.

Ethical practitioners of dentistry residing in the state of South Carolina who may desire to join the society are requested to send their names and addresses to

W. Busey Simmons, *Sec'y,*
Piedmont, S. C.

NORTHERN OHIO DENTAL ASSOCIATION.

The fifty-third annual meeting of the Northern Ohio Dental Association will be held in Toledo, at Hotel Secor, June 7, 8, and 9, 1910.

It is a good time now to plan for this meeting. Excellent papers, fine exhibits, A 1 clinics, and a rare meeting-place.

C. F. Woodbury, *Ch'man Ex. Committee,*
Cleveland, Ohio.

UNIVERSITY OF ILLINOIS COLLEGE OF DENTISTRY.

Alumni Association.

The Alumni Association of the College of Dentistry, University of Illinois, will hold their third annual clinic and meeting on Wednesday, June 1, 1910, in the college building, corner Harrison and Honore sts., Chicago. It will be a strictly alumni clinic, but ethical members of the profession are invited to be present.

Frank J. Ryan, *Sec'y.*

MASSACHUSETTS DENTAL SOCIETY.

Change of Date of Meeting.

The Massachusetts Dental Society will hold its forty-sixth annual meeting at Springfield, June 14, 15, and 16, 1910. An attractive program will be presented.

Ethical practitioners of dentistry residing in the state of Massachusetts who may desire to join the society are requested to send their names and addresses to

Charles W. Rodgers, *Sec'y,*
165 Harvard st., Dorchester, Mass.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

The thirteenth annual meeting of the Southern California Dental Association will convene June 16, 17, and 18, 1910, at the College of Dentistry, University of Southern California, Fifth and Wall sts., Los Angeles. Visiting dentists are cordially invited.

This is the first of the coast meetings, and is followed by the California State Dental Association, at San Francisco, the Oregon Association at Portland, and the Washington Association at Seattle.

These meetings convene at intervals of a

few days, the series being completed in time to reach Denver for the National Dental Association.

B. Frank Gray,
Ch'man Publicity Com.

WISCONSIN STATE DENTAL SOCIETY.

The fortieth annual meeting of the Wisconsin State Dental Society will be held at Ashland, Wis., July 12, 13, 14, and 15, 1910.

Harvey N. Jackson, *President*,
Milwaukee, Wis.
M. L. Christensen, *Sec'y*,
Oshkosh, Wis.

VIRGINIA STATE DENTAL ASSOCIATION.

The forty-first annual session of the Virginia State Dental Association will be held at Staunton, Va., July 20 to 22, 1910.

Every effort is being made to make this the most interesting and successful meeting of our society. Men of national reputation will give clinics and read papers. All ethical practitioners are cordially invited to attend.

W. H. Pearson, *Cor. Sec'y*,
Hampton, Va.

NEW JERSEY STATE DENTAL SOCIETY.

The fortieth annual meeting of the New Jersey State Dental Society will convene in Asbury Park, N. J., at the Casino, July 20, 21, 22, and 23, 1910. This is to be the largest meeting ever held; two days will be devoted to different and interesting clinics, which should not be missed. Many fine and instructive papers to be read. The Hotel Columbia will be the headquarters of the society.

Asbury Park is ideal for the meetings of the society, with its ocean frontage, large and cool. The entire floor of the Casino is to be leveled for the exhibits, which will be many and varied, and everything new will be shown.

Asbury Park can be readily reached by rail, boat, or motor, and will be a good resort for the visitors to bring their families, who will find the hotels large and commodious and the entertainment of a high class, while they attend the meetings. No one can afford to miss this meeting. Prospective members, ethical practitioners of other states, and members of local societies are cordially invited.

For further information address

Charles A. Meeker, *Sec'y*,
29 Fulton st., Newark, N. J.

NINTH DISTRICT (N. Y.) DENTAL SOCIETY.

The third meeting of the Ninth District Dental Society of the State of New York was held at Ossining, N. Y., February 11, 1910.

In the afternoon clinics were given by Dr. Short of New York city, who demonstrated "Compound Cavity Preparation and Cast Gold Inlay." Dr. A. W. Twigger of Ossining demonstrated a "Jacket Crown." Dr. W. V. Randall of Newburgh explained his system of "Millimeter Bands and Crown,"—a very exact and ingenious method of making gold crowns.

At 6.30 P.M. a banquet was served at the Weskora Hotel, after which the president, Dr. E. G. Parker, gave his annual address, which was warmly applauded; then followed the regular order of business.

About thirty dentists were present, coming from all parts of the district.

Wm. M. Fancher, *Recording Sec'y.*

OHIO STATE DENTAL SOCIETY.

Miller Memorial Committee.

To the Dental Profession of America,—At the December 1909 meeting of the Ohio State Dental Society it was unanimously resolved that an American Memorial be established to perpetuate the memory of the late Dr. Willoughby D. Miller, as an evidence of the profession's appreciation of his laborious and fruitful researches for the scientific advance of dentistry.

From the consensus of opinion of various state and local societies, it was decided that the memorial take the form of a monument, to be erected in a suitable public place in Columbus, Ohio, the capital of Miller's native state. The monument is to consist of a life-size bronze of Dr. Miller, mounted upon a granite base of suitable proportions with appropriate tablets, the cost of which will approximate $8000.

Though his scientific career was in a foreign land, the great pride he showed in his

American citizenship, the love for his profession in America, and his final plans for educating students in his own country in the line of work he had so ably begun, should make this memorial movement national in its scope, and to this end the committee in charge has selected honorary committees in the several states to co-operate in bringing this matter to a successful issue.

This movement has received the indorsement of the National Dental Association. Ohio will raise $1200 for this fund, and it is the desire of the committee to have one tablet to state that contributions were received from representatives of the profession in every state of the Union.

Contributions are desired from individuals as well as societies; in fact, many small subscriptions are preferable to a few large ones.

The committee has selected Dr. Weston A. Price, 10406 Euclid ave., Cleveland, Ohio, to act as treasurer of this fund, and to him all subscriptions should be made payable.

That your state may be represented in this fund and appear in the published list of subscribers, we ask your earnest support. Your response to this appeal will be the measure not only of the success of our committee but of the appreciation of American dentists for one who raised the standard of the profession.

Yours very respectfully,

EDWARD C. MILLS, *Chairman*, 16 S. Third st., Columbus, Ohio.

J. R. CALLAHAN, 25 Garfield Place, Cincinnati, Ohio.

S. D. RUGGLES, Portsmouth, Ohio.

WASHINGTON BOARD OF EXAMINERS.

THE Washington State Board of Examiners will meet in Seattle, Wash., May 26, 1910, for examination of applicants for licenses.

WM. B. POWER, *Sec'y*,
Seattle, Wash.

MISSISSIPPI DENTAL EXAMINERS.

THE Mississippi Board of Dental Examiners will meet at Jackson, Miss., on May 17, 1910. All applicants must be recommended by two reputable citizens of the state.

L. B. MCLAURIN, *Sec'y*.

MARYLAND BOARD OF EXAMINERS.

THE Maryland State Board of Dental Examiners will meet for examination of candidates for certificates May 19 and 20, 1910, at the Dental Department of the Baltimore Medical College, Baltimore, at 9 A.M.

Candidates must pass a written examination in anatomy and physiology, oral surgery, chemistry and bacteriology, pathology, therapeutics and materia medica, operative and prosthetic dentistry. The practical tests are the insertion of a gold filling in the mouth, and the submission of a metal plate or bridge of not less than four crowns, two being of porcelain, the parts being assembled and invested in advance and soldered in the presence of the board. Applications, accompanied by the fee of ten dollars, must be filed with the secretary prior to May 19th.

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

ALABAMA BOARD OF EXAMINERS.

THE Board of Dental Examiners for the state of Alabama will meet in Mobile, Ala., on the Monday before the second Tuesday in May 1910. In addition to the regular written examination, the following requirements will be added: Each applicant must fill at least two teeth, approximal cavities, one with gold, the other with alloy, work to be done under the immediate supervision of the board, the latter to determine or pass on suitable selections of cavities. The board will try to furnish subjects, but failing to do so, applicants for license must find or bring their own subjects, also instruments and material.

Each applicant must take or have taken an impression of their own mouth, make a plaster cast of the same, cut from the cast the six anterior teeth, and make a bridge for the same with porcelain facings. Cast can be made and facings fitted before the examination, but the backings must be put on and facings arranged, also invested and soldered, under the supervision of the board, hard solder being required; or the applicant must pass any other test the board may desire.

THOS. P. WHITBY, *Sec'y*.

WISCONSIN BOARD OF EXAMINERS.

The Wisconsin State Board of Dental Examiners will hold a meeting for the purpose of examining applicants for license to practice dentistry, beginning June 20, 1910, in the Dental Department of the Marquette University, Milwaukee, Wis. All applications, together with a fee of $25, must be in the hands of the secretary fifteen days before the examination.

For further information address

C. S. McIndoe, *Sec'y*,
Rhinelander, Wis.

WEST VIRGINIA BOARD OF EXAMINERS.

The West Virginia State Board of Examiners will hold a meeting at Wheeling, W. Va., June 8, 9, and 10, 1910. Applicants for examination must file their applications, together with the fee of twenty-five dollars.

For blanks and other information address

J. Fleetwood Butts, *Secy*,
Charleston, W. Va.

NEW HAMPSHIRE BOARD OF REGISTRATION.

The next meeting of the New Hampshire Board of Registration in Dentistry for examinations will be held at Masonic Banquet Hall, Manchester, N. H., June 1, 2, and 3, 1910.

No special examinations. All persons must become registered before beginning practice.

A. J. Sawyer, *Sec'y*,
Manchester, N. H.

ARKANSAS BOARD OF EXAMINERS.

The next meeting of the Arkansas State Board of Dental Examiners will be held June 6th and 7th, in Little Rock.

All applicants are required to pass an examination, making a general average of 75 per cent.; with or without diploma. The examination covers all branches taught in the dental schools, and is theoretical only; no temporary license, no special examination. Fee fifteen dollars.

A. T. McMillin, *Sec'y*,
Little Rock, Ark.

MASSACHUSETTS BOARD OF REGISTRATION.

A meeting of the Massachusetts Board of Registration in Dentistry, for the examination of candidates will be held in Boston, Mass., June 1, 2, and 3, 1910.

Application blanks may be obtained from

G. E. Mitchell, *Sec'y*,
25 Merrimack st., Haverhill, Mass.

IOWA BOARD OF EXAMINERS.

The Iowa State Board of Dental Examiners will hold a meeting for the examination of candidates for license to practice dentistry in Iowa, beginning June 6, 1910, at 9 a.m., at Iowa City.

For blanks and other information write

E. D. Brower, *Sec'y*,
Le Mars, Iowa.

CONNECTICUT DENTAL COMMISSIONERS.

The Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Thursday, Friday, and Saturday, June 16, 17, and 18, 1910, to examine applicants for license to practice dentistry. Application blanks, rules, etc., will be forwarded by the recorder upon request.

By order of the Commission,

Gilbert M. Griswold, *Recorder*,
783 Main st., Hartford, Conn.

MINNESOTA BOARD OF EXAMINERS.

The next regular meeting of the Minnesota State Board of Dental Examiners will be held at the dental department of the state University, in Minneapolis, June 6, 7, 8, and 9, 1910.

All applications must be in the hands of the secretary ten days before. All applicants must be graduates and must present their diploma. Those having practiced in any of the following states for five years or more will be exempt from the theoretical examination: Iowa, Indiana, Michigan, Nebraska, Wisconsin, or Montana. Minnesota dentists are admitted to those states on same conditions. For blanks and further information apply to

Geo. S. Todd, *Sec'y*,
Lake City, Minn.

PENNSYLVANIA BOARD OF EXAMINERS.

The next regular meeting of the Pennsylvania State Board of Dental Examiners will be held on June 8, 9, 10, and 11, 1910, in Musical Fund Hall, Philadelphia, and in the Pittsburg Dental College, Pittsburg. For further information address Department of Public Instruction, Harrisburg, or

G. W. Klump, *Sec'y*,
Williamsport, Pa.

TEXAS BOARD OF EXAMINERS.

The regular meeting of the Texas State Board of Dental Examiners will be held in Houston, Texas, beginning 9 A.M. Monday, June 13, 1910. Diplomas not recognized or registered; examination required of all. No interchange of license with any other state. No special examination to practitioners already in active practice. Applications, accompanied by a fee of twenty-five dollars, should be in the secretary's hands by June 10th.

For further information address

Bush Jones, *Sec'y*,
Dallas, Texas.

ILLINOIS BOARD OF EXAMINERS.

The semi-annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for license to practice dentistry in Illinois will be held in Chicago, at the Northwestern University Dental School, corner Lake and Dearborn sts., beginning Monday, June 13, 1910, at 9 A.M.

The following preliminary qualifications shall be required of candidates to entitle them to examination by this board for license to practice dentistry in the state of Illinois: Graduates of a reputable dental or medical school or college, or dental department of a reputable university, who enter the school or college as freshmen on or after the school year 1906-07, must have a minimum preliminary education of not less than graduation from an accredited high school or a certificate from the state superintendent of public instruction, equivalent officer or deputy, acting within his proper or legal jurisdiction, showing that the applicant had an education equal to that obtained in an accredited high school; which certificate shall be accepted in lieu of a high-school diploma.

Candidates will be furnished with proper blanks and such other information as is necessary on application to the secretary. All applications must be filed with the secretary five days prior to date of examination. The examination fee is twenty dollars, with an additional fee of five dollars for a license.

Address all communications to

T. A. Broadbent, *Sec'y*,
705 Venetian Bldg., Chicago, Ill.

INDIANA BOARD OF EXAMINERS.

The next meeting of the Indiana State Board of Dental Examiners will be held in the Capitol, Indianapolis, beginning Monday, June 13, 1910, and continuing four days. All applicants for registration in the state will be examined at this time.

No other meeting will be held until January 1911.

For further information apply to

F. R. Henshaw, *Sec'y*,
507-8 Pythian Bldg., Indianapolis.

MICHIGAN BOARD OF EXAMINERS.

The next regular meeting of the Michigan State Board of Dental Examiners for the examination of applicants for registration will be held at Ann Arbor, Mich., beginning Monday, June 20th, and continuing until the 25th. Applications must be in the hands of the secretary at least fourteen days before the examination, and should be addressed to

A. W. Haidle, *Sec'y*,
Negaunee, Mich.

FLORIDA BOARD OF EXAMINERS.

The next annual meeting of the Florida State Board of Dental Examiners will be held in St. Augustine, June 23, 24, and 25, 1910.

Applicants for license to practice dentistry in this state will be required to exhibit diploma from reputable dental colleges, and take examination, both theoretical and practical. The practical will be one gold filling and one amalgam filling in the mouth, one dowel crown to be made and mounted, one upper and lower set of teeth to be set up and ar-

ticulated. Board will furnish models, also head-rests and blowpipes. Applicant must furnish other necessary instruments, also recent photograph with application. Examination fee $20.00, certificate $5.00.

No interchange of licenses with any state. Any further information furnished on application.

W. G. Mason, *Sec'y.*

VIRGINIA BOARD OF EXAMINERS.

The regular annual meeting of the Virginia State Board of Dental Examiners will be held in Richmond, Va., the second Tuesday in June 1910.

For further information address

J. P. Stiff, *Sec'y,*
Fredericksburg, Va.

SOUTH CAROLINA BOARD OF EXAMINERS.

The next meeting for the examination of applicants for license will be held at Glenn Springs, near Spartanburg, S. C., on June 24 to 28, 1910. All applicants must register with the secretary on the 24th. For further information address

B. Rutledge, *Sec'y,*
Florence, S. C.

RHODE ISLAND BOARD OF REGISTRATION.

The Rhode Island Board of Registration in Dentistry will meet for the examination of candidates at the State-house, Providence, R. I., Tuesday, Wednesday, and Thursday, June 28, 29, and 30, 1910. Application blanks and particulars may be obtained from

H. L. Grant, *Sec'y,*
1025 Banigan Bldg., Providence, R. I.

OHIO STATE DENTAL BOARD.

The Ohio State Dental Board will hold its regular spring meeting in Columbus on June 21st to 24th, inclusive. All persons desiring to secure licenses at this time should write the secretary for blank application and return same, with the fee of twenty-five dollars, not later than June 11th.

For further information address

L. L. Yonker, *Sec'y,*
Columbus, Ohio.

NEBRASKA DENTAL BOARD.

The regular meeting of the Nebraska Dental Board for the examination of applicants for license to practice dentistry in Nebraska will be held in Lincoln, at the State-house, beginning Monday, June 27, 1910, at 9 A.M. All applications must be in the hands of the secretary by June 20th. For application blanks and other information address

H. C. Brock, *Sec'y,*
North Platte, Nebr.

MAINE BOARD OF EXAMINERS.

The Maine State Board of Dental Examiners will meet in Portland, Me., July 5, 1910, for the examination of applicants for license to practice dentistry.

For information address

E. C. Bryant, *Sec'y,*
Pittsfield, Maine.

SOUTH DAKOTA BOARD OF EXAMINERS.

The South Dakota State Board of Dental Examiners will hold its next regular meeting at Sioux Falls, S. D., July 6, 1910, beginning at 9 A.M., and continuing three days. All applications for examination, together with a fee of twenty-five dollars, must be in the hands of the secretary by June 26th. Applicants who have not complied with the above will not be permitted to take the examination.

G. W. Collins, Sec'y,
Vermillion, S. D.

NEW JERSEY BOARD OF REGISTRATION.

The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the Assembly chamber of the State-house at Trenton, N. J., July 5, 6, and 7, 1910. Practical work on the 5th, and the theoretical examination the 6th and 7th. All applications must be in the hands of the secretary ten days prior to the meeting. Applicants must send preliminary credentials and photograph with the application, or it will not be accepted.

Sessions begin promptly at 8 A.M. each day.

Chas. A. Meeker, D.D.S., *Sec'y,*
29 Fulton st., Newark, N. J.

ARMY DENTAL CORPS.

MEMORANDUM of changes of stations and duties of dental surgeons, U. S. Army, for the week ending April 2, 1910:

R. H. Mills, March 26th, reported for temporary duty, Plattsburg Barracks, N. Y.

George H. Casaday, March 22d, returned to Presidio of Monterey, Cal., from leave of absence.

Minot E. Scott, March 14th, ordered to proceed from Vancouver Barracks, Wash., to Fort Stevens, Oregon, and Fort Columbia, Wash., for temporary duty.

R. E. Ingalls, March 25th, reported for duty at Fort Douglas, Utah.

For the week ending April 9th:

Minot E. Scott, April 1st, reported for temporary duty at Fort Stevens, Ore.

R. M. Hollingsworth, April 7th, upon arrival at San Francisco, Cal., will proceed to his home, and upon arrival report by telegraph to the Surgeon-general of the army, for annulment of contract.

For the week ending April 16th:

Frank F. Wing, April 8th, upon arrival at San Francisco, Cal., will proceed to Fort D. A. Russell, Wyo., for duty at that station.

George L. Mason, April 8th, upon arrival at San Francisco, Cal., will proceed to Fort Snelling, Minn., for duty at that station.

George I. Gunckel, April 10th, returned to Fort McPherson, Ga., from temporary duty at Fort Moultrie, S. C.

Robert T. Oliver, April 12th, reports departure from detached duty at Fort Slocum, *en route* to his station, Fort Hamilton, N. Y.

R. H. Mills, April 12th, reported for temporary duty at Fort Ethan Allen, Vermont.

George D. Graham, April 13th, left Fort Crook, Neb., *en route* to Fort Omaha, Neb., for temporary duty.

For the week ending April 23d:

George D. Graham, April 14th, reported for temporary duty at Fort Omaha, Neb.

Robert M. Hollingsworth, granted leave of absence for two months.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING MARCH 1910.

March 1.

No. 950,768, to JOHN F. HAMMOND. Dental bracket engine.

No. 950,988, to CHAS. F. BOOTH. Aseptic dental tray and stand therefor.

March 8.

No. 951,130, to JAS. B. JORDAN. Saliva ejector.

No. 951,614, to C. L. KEMERY. Casting apparatus.

March 15.

No. 951,860, to E. W. WALLACE. Dental tweezers.

No. 951,891, to E. W. WALLACE. Dental tweezers.

No. 952,155, to E. L. TOWNSEND. Artificial tooth.

No. 952,229, to W. A. BURNS. Artificial tooth.

No. 952,247, to V. H. HOBSON. Cuspidor.

No. 952,437, to W. B. MILLER. Dentist's mandrel.

March 29.

No. 953,022, to A. F. DOLLIN and E. W. COUPER. Dental spray attachment for handpieces.

No. 953,042, to WALTER LAMB. Dental hot-air appliance.

No. 953,072, to T. C. TRIGGER. Tooth swage.



MONUMENT TO HORACE WELLS.

(Unveiled March 27, 1910, at Paris, France.)

THE

DENTAL COSMOS.

VOL. LII. JUNE 1910. No. 6.

ORIGINAL COMMUNICATIONS.

SYSTEMATIC INDEXING AND CLASSIFICATION OF DENTAL LITERATURE AND ITS POSSIBLE RESULTS.

By ARTHUR D. BLACK, B.S., M.D., D.D.S., Chicago, Ill.

(Read before the First District Dental Society of the State of New York, December 14, 1909.)

IF we may judge by the happenings of the recent past, by present conditions, and by numerous signs of the times, there is to be a considerable change in those things which will be uppermost in the attention of the dental profession of America within the near future. The writer will not at this time attempt to analyze these things further than to call attention to the fact, based on a review of our literature, that there has been during the past twenty years a gradual drift away from the field of scientific investigation, excepting by a very few men, and there has been accumulating during this period a mass of work which is calling loudly for attention. Many men are beginning to realize that to those of the dental profession who have the ability and are willing to labor for the love of learning the truth, fields are open which offer opportunities to earn places with our most renowned scientists of the past or present.

It is in the writer's mind that the dental profession as a whole needs today one thing even more than it does scientific investigation, viz, the development of the habit of study; of careful selection, methodical reading, and assimilation of our literature; the ability to compare and weigh the opinions of different men and select and apply in daily practice those things which will improve dental service. The profession must so develop, else the work of our scientific men will be of little value. It is the purpose of this paper to present a plan of indexing and classifying dental literature which will be a material aid and incentive to the profession in such development.

Seventy years have passed since Hayden and Harris founded the Baltimore College of Dental Surgery, since the *American Journal of Dental Science* was established, since the American Society of Dental Surgeons was organized. The first sentence of the address of the publishing committee of the *American Jour-*

nal of Dental Science, dated New York, June 1, 1839, reads as follows: "The period has at length arrived when the profession to which we belong assumes a commanding position in the public eye, and challenges successful rivalship with the other useful and profitable avocations [vocations] of men." In the same issue we find a review of the first edition of Chapin A. Harris's book, "The Dental Art," etc., later known as "The Principles and Practice of Dentistry." This period marked the beginning of the organization of dentistry as a distinct profession, and was without question the most remarkable epoch in its development. Too much credit cannot be given to Hayden and Harris and the group of men who assisted them. Contemporaneous with their work was that of the greatest scientist the profession in England has produced, Sir John Tomes.

During the threescore years and ten which have elapsed, many important epochs have come and gone; much real progress has been made. One cannot review the record without realizing that great things have been accomplished, nor without feeling optimistic for the future. Those men who are now old enough to have seen much of this progress can realize best the changes which have taken place; they know of the many sacrifices made by the pioneers now gone, and of their own, whereby they have contributed to our profession's progress. What knowledge have our younger men of these things? What do the men who have entered practice in recent years know of the struggles and sacrifices of those who carried the burden which has enabled us to be where we are today? Is it not true, as a general statement, that each practitioner's knowledge of dentistry is closely limited to the period since he entered the profession's ranks? How many dentists may we find who have read books or journals published previous to the time when they entered college? Are we so much wiser than the men who have gone, that we do not need to know what they wrote? And have we come to this conclusion through investigation of the literature of the past, or by closing our eyes and saying, It is so.

How has the record of these seventy years been kept? Where is it now? Are we making the best use of the recorded experiences of the past in our work of today? Are we doing full justice to those wonderful, courageous, and unselfish men who have done so much for the uplift of dentistry? I am here tonight to offer a plan by which we may partially pay our debt to those men, and at the same time gain much for ourselves. I bring to you a key by which you may easily unlock the closed and hitherto inaccessible records, and I have also brought a considerable part of the record that has already been unlocked, and is in such form that one may reach into the past and select any single item which he may desire.

Twelve years ago the writer began the collection of a good dental library. This work had not progressed far when it was realized that several hundred bound volumes of our dental journals were almost valueless on account of the impracticability of attempting to find articles on particular subjects when wanted. Each yearly volume contains an index, usually with titles arranged alphabetically and without due regard to the placing of the important word first, making it necessary to look through almost the entire index of each volume for the articles on any subject. Such a procedure, applied to many volumes, soon becomes too great a task to be practical, and such a library is therefore very nearly useless.

THE DEWEY DECIMAL CLASSIFICATION.

The writer undertook the rather formidable task of indexing a part, at least, of the journals on hand, and after studying the various library systems the plan of the Dewey decimal classification was adopted. Stated very briefly, this plan is one in which a number is used to represent each subject, and no attention whatever is paid to the wording of the title. There is a definite relation of numbers, which gives each a meaning

and makes it easy to remember them. In Dewey's classification the entire field of knowledge is first divided into ten main classes, each of these into ten divisions, and each division into ten sections, making one thousand sections in all.

The main classes are: 1, Philosophy; 2, Religion; 3, Sociology; 4, Philology; 5, Natural Science; 6, Useful Arts; 7, Fine Arts; 8, Literature; 9, History; 10, General Works. The 6th of these, Useful Arts, is numbered 600, and is divided as follows: 610, Medicine; 620, Engineering; 630, Agriculture; 640, Domestic Economy; 650, Communication, Commerce; 660, Chemical Technology; 670, Manufactures; 680, Mechanic Trades; 690, Building. Each of these divisions is again divided into ten sections; for example, 610 Medicine is divided as follows: 611 Anatomy and Histology, 612 Physiology, 613 Hygiene, 614 Public Health, 615 Materia Medica and Therapeutics, 616 Pathology, 617 Surgery, including Dentistry, 618 Diseases of Women and Children, 619 Comparative Medicine.

Each of the original ten classes and each of the one hundred divisions is similarly divided, each having its special number, and the relation of these numbers will be noted. Further divisions of each section are made by adding figures in the decimal positions, and the subdivisions may be thus carried out indefinitely without changing the section numbers. For example, 611 Anatomy is divided into 611.1 circulatory system, 611.2 respiratory system, 611.3 digestive system, 611.4 glandular and lymphatic system, etc.

In addition to this classification, which applies to all literature, there is an alphabetical index of titles, which enables one to find the number under which any desired subject is classified.

CLASSIFICATION FOR DENTISTRY.

It was necessary to construct a classification for dentistry, as this subject had not been worked out. Dewey's number for Dentistry, 617.6 was used and subdivided as follows:

617.6 Dentistry.
617.61 Dental Anatomy, Histology, and Physiology.
617.62 Operative Dentistry.
617.63 Prosthetic Dentistry.
617.64 Orthopedic Dentistry.
617.65 Oral Hygiene.
617.66 Dental Pathology.
617.67 Oral Surgery.
617.68 Dental Jurisprudence and Ethics.

Since the number 617.6 representing Dentistry is repeated in each of the above and would also be in all subdivisions, the letter D was substituted for it, in order to simplify and shorten the numbers used; thus D1 represents dental anatomy, D2 operative dentistry, D3 prosthetic dentistry, etc. Each of these branches of dentistry was then subdivided one or more times, as seemed necessary to properly classify the articles in our literature. The complete dental classification was published in connection with a paper read by the writer before the Institute of Pedagogics in December 1908, and will not be repeated here.* As an example, the principal divisions of D2, operative dentistry, will be given:

D2 Operative Dentistry.
21 Instruments and appliances.
22 Filling and filling materials. Filing. Separation.
221 Gold.
222 Amalgam.
223 Cement.
224 Gutta-percha.
225 Tin.
23 Inlays.
24 Pulp treatment.
241 Capping.
242 Destruction and removal.
243 Root-filling.
25 Prophylaxis.
26 Bleaching.

The full classification for dentistry, as at present worked out, contains something more than one hundred headings, in addition to the headings, such as those in materia medica, etc., which are to be found in other subdivisions of medicine. The index to this classification contains about six hundred items.

* *Dental Era*, vol. viii, page 462.

The use of the classification is as follows. The main headings are sufficient for books, while the subdivisions are used for chapters in books, journal articles, and smaller items. A book on operative dentistry would be classified under D2, and a chapter on filling with gold under D221, pulp-treatment under D24, etc. Subdivisions have been or may be made so that any single subject or item may have its particular number under its proper heading; these subdivisions may be made again and again without in any way affecting the more important divisions containing fewer numerals.

The title of each book, essay, or item to be classified is written on a card, together with the author's name, and for journal articles, the name of the journal, year, volume, and page, together with other desirable data. In the upper left corner of the card is placed the classification number of the subject under which the article naturally belongs. The cards are arranged in accordance with the classification numbers, and we therefore have all the cards for each subject together in a separate group. If one desires to look up the articles that have been written on a particular subject, it is only necessary to know the number for that subject, which may be found by consulting the index, and to find the group of cards bearing the number. For example, all cards marked D221 would index articles on filling with gold, D222 on filling with amalgam, D65 alveolar abscess, etc. Another card is written for each article, with the author's name at the top. These are filed alphabetically, so that all of the writings of each author are grouped together.

The writer has made a complete index for the first series of the *American Journal of Dental Science,* 1839 to 1850, *Dental News Letter* from 1847 to 1859, the DENTAL COSMOS from 1859 to date, and the *Dental Review* from 1886 to date, also for the Transactions of the Illinois State Dental Society 1865 to date. Considerable indexing of other journals has been done by the Illinois and Ohio State Dental Societies, also a limited amount by several individuals. In all, about fifty thousand cards have been written.

In order that the members of this society may get the best possible understanding of this system, and with the idea of leaving with you something that may be of real value, I have selected from my cards those which refer to the work of this society, as published in the COSMOS, and take pleasure in presenting the same in the form of a printed booklet. This index will give you a good idea of the wide range and splendid character of the work of your organization, of which you surely have the right to be very proud.

So far as the writer can learn, the only other similar work has been by Emil Huet of Brussels. He read before the Société d'Odontologie de Paris a paper entitled "De l'Utilité de la Classification Décimale en Odontologie et en Stomatologie";* also a paper before la Société Belge de Stomatologie, entitled, "Indexation Décimale des Fiches Bibliographiques en Stomatologie."† He presents a very elaborate scheme, by the use of what are known as form divisions. These form divisions are different series of numerals to indicate substances employed in dental operations, methods of procedure, etc. I cannot give you a better idea of his plan than to present a couple of his examples. For gold inlays he uses the following numbers:

616.314	08927	+ 151	+ 67
odontologie	*obturation*	*or*	*inlay*

For the repair of a vulcanite denture:

616.314	08928.5	+ 125	+ 9
odontologie	*dentier*	*vulcanite*	*réparation*

It will be noticed that Dr. Huet uses the number 616.314 for dentistry. The Dewey number for pathology is 616, and 616.31 is applied to the mouth, tongue, fauces. Dentistry has been placed as the fourth subdivision under this number.

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* *L'Odontologie,* January 30, 1908.

† *La Revue Trimestrielle Belge de Stomatologie,* 1808, No. 3, September.

For gold inlays, his second number, .08927, indicates the method of treatment by filling, the third number, 151, indicates the substance employed, gold, and the last number, 67, shows the method used, inlay. In his number for the repair of a vulcanite denture, the 08928.5 indicates a denture, the 125 vulcanite, and the 9 a repair.

For the gold inlay, we use the number D23, the D indicating dentistry, the 2 operative dentistry, the 3 inlays. We can at any time divide this into gold and porcelain or other inlays by the addition of one or more figures. For a vulcanite denture we use D321, the 3 indicating prosthetic dentistry, the 2 artificial dentures, and the 1 vulcanite. We have no special number for repairs, but one can be added, if the need becomes apparent.

Dr. Huet deserves much credit for his work on this subject, and I regret that time does not permit me to give you a full explanation of his plan, which is extremely elaborate—too much so in its present form, I fear, to be of great practical value. The most important difference between Dr. Huet's classification and my own is that mine has been developed to fit our literature as the actual work of indexing has progressed, while his has not, I believe, been subjected to this practical test. As a matter of fact, in my classification the subdivisions have only been added as the need for each became apparent.

Mention should be made of the "Index to the Periodical Literature of Dental Science and Art, as presented in the English Language," by the late Dr. Jonathan Taft, in 1886. This book of 212 pages is divided into three parts, the first being a list of all dental journals published from 1839 to 1886, the second an alphabetical list of the principal papers which had appeared in twenty-four dental periodicals, and the third an alphabetical list of authors, with the names of subjects upon which papers by each may be found.

Mention should also be made of the index of vols. i to xxiv of the DENTAL COSMOS, compiled by Dr. James E. Dexter and published in 1883. This is a book of 367 pages and contains in a single alphabetical list all articles in the volumes mentioned. Articles are indexed by titles, also by the subjects mentioned in the articles. There is included a list of authors, with index to the writings of each.

The DENTAL COSMOS published from 1889 to 1902 a "Monthly Bibliography of Dental Literature," compiled by J. Melvin Lamb. This covered both books and articles in journals, arranged alphabetically by authors.

THE POSSIBILITIES.

The use of this plan suggests possibilities so great as to involve almost every phase of dentistry, and I find it difficult to keep from getting into fields that will lead the discussion away from the principal thought of the paper. I wish to avoid talking of ideals that it will be impossible to obtain in the near future, and to present real practical possibilities.

DENTAL INDEX BUREAU.

As a result of the presentation of this subject at the meeting of the Institute of Dental Pedagogics at St. Louis a year ago, a committee was appointed which has developed plans for the organization of a Dental Index Bureau. The purpose of this bureau is to supply to subscribers a classified index of a considerable part of our current dental literature on the system herewith presented, and to include the literature of past years as rapidly as may be practicable. The plans contemplate the employment by the bureau of a competent cataloger who will do the indexing, and of a stenographer to write the cards and arrange the material in proper form for the printer, and the distribution of the printed copies to all subscribers. It is the belief of the committee that most of our journal editors and schools, and quite a number of societies and individuals, will gladly support this movement.

INCREASED VALUE OF DENTAL LIBRARIES.

The first effect of such an index in each dental library would be to make the material in such libraries easily accessible. All the literature upon any subject would be at the command of the man who wished to use it. It would open the long-closed and dusty bound volumes of dental journals in our libraries, which contain much of our best writings, to the eyes of the average man, and enable him to find what he wants without difficulty or delay.

At first thought this might seem to be enough. But what real, practical result would there be? While such an index would make it possible for every man to find desired information on any point arising in practice or any subject on which he might wish to read or write, what would be the practical result? How many more would consult our dental libraries because of the ease with which articles on certain subjects might be found? The writer is inclined to the belief that the number would not be much increased, but that those who have studied our literature a little heretofore would be attracted to the library much oftener on account of the ease and quickness with which articles could be found. A fair percentage of new readers would doubtless be attracted, but there would be little change in the attitude of the profession as a whole. If we stopped here, the greatest benefit would be to the individual whose natural inclination is to study, and the percentage of such men in the dental profession is small. How may others be interested? That is the most important question.

THE DENTAL COLLEGE.

A beginning should be made in the dental college. Most of our better schools have fairly good libraries, which are little used. Suppose each school library should be equipped with such an index. The cultivation of the habit of study should begin with the beginning of the freshman year and continue throughout the course. Each professor should select certain articles in the journals or certain chapters in books, which would present the views of others, possibly directly opposed to his own; these should be assigned to the class for reading, and oral or written quizzes should be given on them alone. This would need to occupy but a small percentage of the student's time. If half a dozen professors each required the reading of five or ten well-selected articles by the students of each class during the year, the student's view would be broadened, he would learn to think, select, and weigh the important items in an article; the habit of study would be encouraged, and our students would be graduated with less of the one-man idea for each subject. The habit of study is actually discouraged by the present methods of many of our teachers in giving students one method only, without reference to the views of other men. Many papers appear from the pens of men who have been a few years out of college which bear so strongly the imprint of a certain teacher, and none of others, that we may easily say from what school the writer was graduated, indicating that such men as students have not been taught to look for knowledge in other than a single direction.

THE DENTAL SOCIETY.

It is within the dental society that the greatest possibilities exist for fostering the habit of study, and many plans may be followed. In this paper I will present but one, which has been developed by the Illinois State Dental Society in its postgraduate study course, and has as its principal object the cultivation of the habit of study among the profession at large in Illinois. Its ultimate success contemplates the actual study of a little, at least, of our journal literature by a large number of our men. Particular attention is called to the fact that this plan has now been in operation for more than a year, and there is every indication that it will be successful.

In the reorganization of the Illinois State Dental Society, five years ago, the membership was increased in one year

from less than 300 to more than 1250. The number has since increased to nearly 1700, which is divided about equally between Chicago and the state outside. Outside Chicago the membership is divided into twenty-six district societies, which meet at more or less frequent intervals during the year. In Chicago plans are under way for the formation of eight or ten branches of our city society. It is within these component organizations that our postgraduate study course is being worked out. As a basis for this work, four journals—Cosmos, *Items, Digest,* and *Review*—were selected, and all of the articles in each were indexed and classified on the plan herewith presented, covering a period of five years, 1903–07. The same journals have been similarly indexed for 1908, and the work on the 1909 issues is in progress. This gave the committee in charge complete lists of all articles appearing in these volumes, arranged according to the subjects in the classification. Subordinate committees were then appointed for several of the more important branches of dentistry, one for pathology, one for materia medica and therapeutics, one for operative dentistry, one for prosthetic dentistry, etc. Courses were then mapped out for each of these committees on a general plan which would make the work of all harmonious. To each committee were assigned all of the articles on a particular subject. For this subject the committee prepared a list of from fifteen to twenty-five pertinent questions. The list of articles was then divided among the members of the committee, and each read those assigned to him, with the object in mind of finding paragraphs which answered the questions. Notations were made under each question indicating where the answers could be found. The work of the various members of each committee was combined and published in the form of a report. These reports consist of the list of questions on the particular subject, with a number of notations, each indicating the name of the author, with the journal, volume, year, and page on which an answer is given. For each question the number of notations will naturally vary greatly—from two or three to twenty-five or more, according to the quantity of literature on the particular subject in the journals reviewed.

The following is the list of titles of one series of such reports, which will convey a good idea of the general plan: No. 1, Etiology of Dental Caries; No. 2, Therapeutic Treatment of Caries; No. 3, Prophylactic Treatment of Caries; No. 4, Cavity Preparation; No. 5, Filling with Gold; No. 6, Inlays; No. 7, Filling with Amalgam. This series has been published with the exception of the report on amalgam, which is in process of preparation. There are other similar series for other branches. With each report are published not only the questions and notations, but also a complete list of the articles reviewed. These reports are published, one each month in the official bulletin of the society, and go to all members. They are now being sent, on special requests, to members of other societies in half of the states of the Union, and to several individuals abroad.

Particular attention is directed to the use of these reports by our local societies. The program committee of each local society selects certain reports to make up a part of the yearly program—a series to occupy several monthly meetings in succession, or a single report for a particular session of a meeting by societies which meet but two or three times a year. For the occasion of the presentation of each subject, the program committee selects certain questions and assigns each to a different member, with the request that he report the views of the various writers on the particular question. To do this he has only to turn to the pages indicated in the notations and make memoranda to be presented at the meeting. In some cases a full subject is assigned to three or four members, and they are allowed to select whatever questions they prefer and make a report on them; several societies have assigned the questions and appointed a quizmaster or referee in connection with the presentation of it.

In connection with this course, about forty small dental libraries have been established in various cities scattered throughout the state, also two circulating libraries. These libraries consist of exactly the same journals as those indexed by the postgraduate course committee, now amounting in each case to twenty-eight volumes, including 1909. These are located in the city public libraries, or other places of convenient access. Journals from the circulating libraries are sent only to members living outside of the cities having libraries. Thus every member of the society has easy access to the literature covered by the course, and as the work of classifying and selecting the material has been previously done by committees, the trouble and labor for the individual is reduced to the minimum. In its simplest form he is handed a question, with a memorandum of a few articles, and the actual page in each on which answers may be found, and the journals are of easy access. This puts the accomplishment of creditable work within the range of each man's ability, and with all of the force and enthusiasm that our great organization is putting back of this course, we are making it go. We are not expecting to accomplish much at once, but many men who could not be induced to write papers have become interested in this work, and it is being pursued with more or less success by practically all of our local societies. It may give a better idea of the large scale on which this undertaking is being carried on to state that more than a hundred members of our society have taken an actual active part in the preparatory work of the various committees, and the number who will present papers or reports before our local meetings during this year will total several hundred. We feel that we have a plan full of possibilities for the future in developing habits of study and writing among our members. There are, however, many other methods by which societies may use such an index.

The publication of the complete list of articles reviewed in connection with each report affords to the individual who is so inclined splendid systematic reading courses which he may pursue independently of the work of the society, and we know that quite a number of our members are taking advantage of this opportunity.

JOURNAL LITERATURE.

An important feature of the use of such an index by the members of our profession who write would be the improvement of our dental journal literature. It is seldom that we see an article in which there appears, either directly or indirectly, evidence that the writer has made a real study of his subject. Probably not one paper in a hundred contains a single direct reference to previously published writings, and it is too often apparent that the writer is unaware of even quite recently published articles. This is shown by the constant repetition of and failure to give proper credit for views previously expressed.

What a difference it would make in the character and value of our literature and in the standing of our profession if even a fair percentage of the articles published were either really original or else gave proper references, and reflected a reasonably full knowledge of previous writings. It should be recognized, however, that our literature cannot advance more rapidly than the men who write. The editor of a dental journal cannot publish the ideal journal, unless the contributions come from ideal writers. Certainly none would welcome with more joy the wide use of such an index than the editors of dental journals.

ORGANIZATION.

It may not be out of place here to call attention to the dependence of all of these movements—of almost every progress that is to be made by our profession, in fact—upon proper organization. When a considerable number of states are as well organized as is Illinois—a condition which is rapidly approaching reality—and when these state organizations are united under national

direction, impossibilities of the past will become natural and easy certainties of the future. If other organized states undertake work similar to our postgraduate course in Illinois, the better dissemination of knowledge will in a few years result in the recognition of the present defects in our literature, and bring about a decided change. The combined work of such states should not only develop good writers but also a demand by the profession for better writings, and there would be sufficient strength in numbers to solve the financial problem of independent journals. But what is of more importance than all else will be the improvement that will come in the general average of dental service if it is possible by the methods mentioned, or by other and similar ones, to develop if only to a fair degree the habit of study in our profession.

A TIMELY THOUGHT OR TWO.

By ALFRED OWRE, D.M.D., M.D., C.M., Minneapolis, Minn.

IT is often advisable to stop a trifle, to call a halt, as it were, in order to ascertain just where we are; in other words, to see if our sense of orientation does not need a little sharpening. It is also natural for man to find fault with the age in which he lives. Several of our deepest thinkers realize that we are in many respects drifting with the current, not caring particularly as to the ultimate shore; it is so easy to move in this direction.

We might censure these thinkers for not coming out with their thoughts more fully, and yet let me ask, Are they to blame in any way for conditions as they are, or are they even capable of expressing themselves in such a way as to function properly in any reform movement?

Perhaps the age we live in has more to do with things as they are than we realize. The romantic idealism of the past is more or less of a myth. The development of power, such as commercial industrialism, autocracy, and the manifestation of the scientific impetus, has had something to do with this.

It is generally understood that we must get on rapidly, even be made great by rapid strides. The worst of this condition is that the means of its being accomplished are seldom considered, so long as it is accomplished. Furthermore, from a commercial viewpoint, it may be considered to have been done according to the ethics of commercial activity.

No one will deny that egotism is the blot upon the escutcheon of a commercial age, and that the crushing of competition is part of the nineteenth century game. To make for the line of least resistance is so natural that we drop into it unconsciously when the opportunity presents.

While this spirit may lend itself to some things, to some grand undertakings and accomplishments, we might, on the other hand, ask if it is of proper usefulness in professional life. Does it constitute as good a basis as we need for such altruistic and professional activities as dentistry and allied humanitarian callings?

The writer is not attaching any special blame to any one of us—that is not the intention of these remarks; he would only try with the rest to find out our true status or to cause us to think more deeply along certain lines. Perhaps if we intensify our individuality we shall have a general reaction upon the whole profession in time.

It is also true that no matter what the environment is, the rank and file of any

calling will always partake thereof. The history of our profession shows that we have always done so, and the greatest danger lies in the fact that the environment may not lend itself completely to true professional growth.

It is needless to say that in this age things grow to stupendous proportions before we are even aware of their existence. Some industries become colossal in magnitude in brief spaces of time, and we have the same force in operation in regard to the great evils of the age, which grow to tremendous size and become almost unmanageable before anyone wakes up and dares to call attention to them.

If we are allowed to move in the line of least resistance without a check of any kind, a disaster must inevitably come. It would be much better if we could be awakened before the crash.

Just what is to accomplish this is not so well worked out, but I am sure that it must be a most subtle instrument. It must operate in the most unconscious manner possible, and still it must be effective, because we are already in the grip and maelstrom of the commercial spirit—to what extent we may not realize, but a few illustrations will suffice to show that this force has been operative upon us for some time, and has used some of the most artistic means to gain its ends. When we are once in the dragon's teeth, secure and fixed, we must extricate ourselves, *i.e.* the movement must be a general one and from within our own ranks, but the stimulus causing this movement need not necessarily come from one of us. As a matter of fact, any force capable of bringing us to a closer and more definite understanding of ourselves would be most welcome, and perhaps from the very nature of things an outside stimulus might be the most desirable. We must see ourselves in due perspective in relation to the rest of the world first, and not as a thing apart.

As an organized body we are still in our infancy, so we cannot compare our present with the glories of the past in this respect, although we can easily refer to some remarkable individual developments which have immortalized dentistry in many ways.

EARLY ORGANIZATION OF DENTISTRY.

As far back as we can go in the history we find some allusion to the practice of dentistry, but unfortunately no organized effort for the dissemination of dental knowledge was made until sixty years ago, whereas the modern university is practically the result of the work of our medical brethren done seven or eight hundred years ago. It was in southern Italy that this took place. Medicine was then so important a branch of knowledge and of such tremendous value to humanity that it was found necessary to establish more concentrated avenues for the education of its votaries—the university practically started thus. It is quite evident that this historic tradition is of the greatest value in medical education and progress today. We say that the private—and shall I say also commercial? —and further, the unendowed schools of medicine are more or less doomed. We still have them and probably shall have them for a long time, but the general spirit and conclusion of our greatest men seems to be that the state or heavily endowed schools should carry on such work. The reason for this is of course that it is of the greatest benefit to the state and community, hence should not become an individual burden. It should be so with all altruistic work. Furthermore, when not dependent upon students for maintenance, idealistic progress is not so far distant. This means more than is generally comprehended.

PREVENTION RATHER THAN CURE.

One of our important ideals must forever be preventive medicine rather than curative. It brings us to scientific laboratory research at once, and while we have had a great many self-sacrificing devotees, I might almost say martyrs, we have not used nearly as much effort in this direction as our enlightenment warrants. This is especially true in regard to dentistry, where we can count

our scientific investigators upon the two hands and have some fingers to spare. Too many are concerned with the cure of diseases; it cannot be otherwise as long as no provision is made for these men to live except by their own efforts as active healers of disease, and the individual spirit of the public is not one which lends itself to anything else. The public is willing to pay for a cure, not for prevention. However, if the state, that is, the conglomerate mass, will undertake to prevent, we should probably not have so much opposition providing a certain amount of preliminary education was indulged in first—so far this has been too limited. Unless a private school is heavily endowed, it will be seen that its work will largely partake of teaching only, and very little of the greater and larger activity, such as research and general dissemination of knowledge for the benefit of humanity.

PRESENT STATUS OF DENTAL EDUCATIONAL ORGANIZATION.

In regard to our educational organization, what has been done? What is its present status, and what can we hope for? These are questions which should interest us vitally. Our future is largely wrapped up in the schools. Originally the trade secret was sold as such; the apprentice was at the mercy of the master. This system is still in vogue to some extent. We need not discuss its "pros and cons," as this system has no future.

We have fifty-five dental colleges. Four of them are *bona fide* departments of state universities, two are endowed, with the remainder owned by private parties. The university has not taken to the idea of incorporating the dental school under its wing for many reasons, the principal one given by them being the low educational status of its members.

Several articles upon the educational problem have appeared quite recently, which show that there is at least some thinking and a realization that things are not right.

Dr. Talbot's articles, "Swan Songs," "Sense and Nonsense," are good efforts in this direction, but perhaps they smack of the specialist's bias; this is always to be guarded against. The specialist of one science is not always able to criticize the world-phenomenon; the vista he commands may be too narrow.

I believe Dr. Miller's last article, read at Amsterdam, gives as fair an outlook upon our status and aims as any philosopher could give of the present time.

Let me say, however, that in the technical sense, strictly speaking, we have done fairly well in all respects. We may well pat ourselves on the back and feel satisfied that our achievements are real ones, but, on the other hand, over-specialization is rather dangerous, to express it mildly. The man of wide reading and culture and broad views tempers the age more perfectly. I believe all recognize the tendency to over-specialization; some praise it, some deplore it because of its one-sidedness. Looking at ourselves from the educational viewpoint, I should say that the causes of the evils and shortcomings of the past and present might be summed up very briefly as follows: (1) Insufficient preliminary requirements; (2) commercial or private control of dental schools, and (3) the lack of a controlling central bureau of education.

SHORTCOMINGS OF PRESENT EDUCATIONAL SYSTEM.

(1) Insufficient preliminary education. This is a cause for many of the shortcomings of a profession which should be classed as a learned one. It accounts for the limited intellectual horizon and the low social status of the members generally, and perhaps also has something to do with the apathetic spirit of faculties of philosophy in regard to dentistry. It probably explains why commercialism has crept in at a tremendous pace, although the spirit of the age may be blamed for this. However, it is true that the soil was fertile.

(2) Perhaps it might be well to speculate further. If commercialism found a soil, it has also operated together with

this first condition to retard progress. Only actual legislation has been effective. I should say that this second cause has made it difficult for state institutions to cope with the whole situation, private schools being in the majority. Any advance which will materially interfere with the income of the private institution is quickly voted down, and the opposition does not end here; it is kept up by influence in legislation.

(3) The third cause, the lack of a controlling and central bureau of education (perhaps the general lack of altruistic organization is responsible for this status) shows that advance is accomplished only by education and coercion of various state forces, and state legislation—rendering progress so very slow, and almost impossible when commercialism has full sway.

CONTROL OF DENTAL EDUCATION BY STATE AND ENDOWED UNIVERSITIES.

The remedy. As the advance in preliminary requirements is not compatible with commercialism, and the establishment of a central bureau of education is not compatible with our present form of government, our only hope lies in state university control, and possibly in that of the endowed university, such as Harvard and Pennsylvania. It will then become the mission of the universities to organize and advance. First, the preliminary training should be looked after and should be brought up as fast as possible to the same standard as that of other learned professions; secondly, the technical requirements should receive attention by thoroughly organizing the various departments so that research can be carried on.

In some such way as this the state university may fulfil its true mission in the commonwealth, serving the people as they should be served in a true democracy. The general belief today among the best thinkers is that the private or unendowed technical school must go, and that the state university is the proper substitute and authority. Aside from its general function of education, it lends weight by its control of all measures having for their aim the improvement of the condition of the public at large, *i.e.* legislation for the betterment or protection of the people will be more easily obtained when backed by a majority of schools associated with state universities. Being maintained by the people, it is gradually being recognized by them as authoritative.

PRELIMINARY REQUIREMENTS FOR THE DENTAL STUDENT OF THE FUTURE.

The prospective dental student should take at least one year of academic work, chemistry, botany, zoölogy, physics—and this is what the university schools will probably agree on very soon. I do not think that just one institution could bring about this change, but all of the university schools should do it before very long, and then as soon as possible add the second or equivalent of a German gymnasium education. The aim should be to have as much work done as possible in the academic college, where these studies properly belong. The University of Minnesota now has an optional six years' course with the college of science, literature, and arts. If I am to delve into the laboratory of the future, however, I should balance up science, culture, and technics so that the apex of the cone would represent the finished dentist—as much so as the finished academician, lawyer, etc., and able to adjust himself socially as well as they.

Concretely illustrating a six years' course, with our present division into grades, high school, and university, the preliminary education of the dental student should be about as follows: Four years of high-school work, with as much drawing, mechanical training, and shop work as possible; then the first two years of academic work as usually understood, although I should choose some studies which particularly lend themselves to the making of a dentist, viz, chemistry, physics, botany, zoölogy, and some method of keeping up finger plasticity; then should come the third year of university work, which is only partially worked out. My

personal opinion is that anatomy (gross and microscopic), physiology, advanced chemistry, electricity, zoölogy, etc., should entitle one to academic credit. The fourth year, being largely elective anyway, should then be spent in the college of dentistry, as well as the fifth and sixth. This gives us four years of dentistry. It ought to be distinctly understood, however, that enough culture studies must be taken, or perhaps studies that have cultural value, to give the student at least a start in this direction.

Our academic friends may object somewhat to the third year of anatomy, physiology, etc., because it lessens the number of culture courses, but it must also be remembered that dentistry itself has a decided cultural value, so that this compromise is not so great after all. Furthermore, the spirit of the age must also be recognized to some extent. Medicine, law, engineering, have met these same problems with some compromise, and "the greatest good to the greatest number" is also applicable, if the true spirit and principle of a democracy be lived up to.

The present moment is a rather critical one in dentistry. If the university schools succeed in this new organization and its projects, it means a parting of the ways from commercial influence and narrowness to university control and a broader, more scientific and cultured profession. The ideal, as it were, will at least be nearer than ever; as it is at present we are hindered in this attainment by the influences mentioned. This ideal may be too high and too far off, but the speculation is tempting, and a practical working modification may be the result, *i.e.* an adjustment to the age in which we live, having the ideal always in mind.

To sum up, then, the factor in our progress toward the ideal will be university control of dental instruction. John Stuart Mill spoke in favor of this over forty years ago in one of his famous lectures at St. Andrews University, and I know of no greater authority. Some of our dental teachers recognize that this must be encouraged, and some have already shown their willingness to make the initial sacrifice in order to bring this about. It will give us more stability as a profession, a better rank and file, and men more generally fitted for great activities.

INADEQUATE ORGANIZATION.

I have already ascribed some of the evils to the general spirit of the age, that allows us to go free to a great extent; on the other hand, we might well ask what we have done to counteract the subtle poison of commercial interest. Have we organized ourselves into associations wide and large enough in scope to be of any great benefit in the combative sense, in the altruistic sense, etc. To be sure, we have local, state, and national societies, but compare their total membership roll with the number of active practitioners in each community. On comparing the membership of the National Association with the total number of practicing dentists in the United States, we find that it is alarmingly small. Let us not deceive ourselves, let us not be overcome by our success in a technical or financial sense; let us see things as they really are. Let us examine the actual work done and the attendance. As a matter of fact we take more interest in the purely technical, relegating all else to the background.

In this respect we have ample illustration. The manufacturers' exhibit, started first as a side issue, has grown to very large dimensions, and we have unconsciously lent ourselves to the growth of it. It is well-nigh impossible to hold a dental meeting of any magnitude without this feature. Indeed, this has gone so far that an exhibit can be held without any dental organization whatever, and as such it has drawn more dentists than the largest dental meeting the world has ever seen. Does this speak well for true professionalism? How does this reflect on our professional organization?

We cannot blame the manufacturers for their doings. They are cunning enough to employ all the most artful means at their command to further their

own ends. It is their business to do so, it is their aim.

What is our aim? Are our energies conserved for it, or dissipated in other directions?

DENTAL JOURNALISM: THE PROSPECTIVE JOURNAL OF THE NATIONAL DENTAL ASSOCIATION.

Let us look into our literature for just one moment. As far as I know we have only one journal entirely independent, and it is not necessary to expostulate at length upon the bias of trade journals. We are all pretty generally aware of existing conditions; not all, however, may know how impossible at times is the situation.

The National Dental Association is trying to solve this problem by establishing an independent journal of its own. We see the need of unbiased journalism, and those who have had a few skirmishes with the majority of our trade journals know how utterly disgusting transactions with them sometimes are. On the surface their aim seems to be to disseminate knowledge, of course, but have they any permanent interest in our dental literature as such? I am forced to think that more often their chief aim is to put before us a lot of advertising pages from month to month. We can illustrate their lack of interest as follows: Many of them keep no files—the old issues are burned, and in some of them there are no annual indices. Does this show anything but an immediate business speculation?

While considering the journals, we might also bring up the value of the contents, and think as deeply again. Are we really "written out," or was that an epigram thrown out merely for the sport of it? I think it originated with Dr. W. X. Sudduth.

However, if there is some truth in such a remark, then what is the use of having so many journals repeating the same things? Why not have one or a few good journals carefully edited or supervised? To accomplish anything in this direction seems a mountainlike task, but we have not sufficiently tried it out, and cannot do so properly until we are thoroughly organized and show more complete unity as a profession.

Shall we say, then, that this lack of unity and organized effort is to blame for a part, at least, of our shortcomings in a literary way, *i.e.* as far as literature for our own needs is concerned?

DENTAL EDUCATION OF THE PUBLIC.

Then just let us take a look into another form of literary activity or educational activity, that of informing the public. It is not a new field altogether, but it certainly is not exploited to any extent, as far as united effort is concerned. The press reaches millions, and the *fuilletons* of the painless quack appear daily, some of which are convincing, although only commercial in aim. We all know that the press is an element in education; the man of the middle class reads nothing else. If we read a paper of value to the public at large, how many people does it reach? If we distribute pamphlets from our office, how far does this dissemination extend as compared to the organized press?

We certainly have a problem here which we must solve sooner or later, and it will require the greatest unity to accomplish anything of moment, so stupendous in effectiveness seems the other side.

But we cannot charge too much to the trade journals and the press. If we are written out as already referred to, and merely running around within a circle, we shall have to come back to the first great consideration, insufficient preliminary and scientific education and lack of general culture.

At present few dentists are able to express themselves even if they have something to say, and if they succeed at all, they record mere facts in regard to technical proceedings, usually without any literary style. But this is not the worst of it; we can accept science and technical statements without literary merit. The chief trouble is that so very few are doing any reading or thinking, and if so, they do not reap the greatest

benefit therefrom on account of insufficient college training.

Organized effort can do something by helping the schools to raise the preliminary standard; then we shall hope to improve the literary output in respect both to quality and quantity. Furthermore, if this technical course itself is lengthened and more thoroughly graded and systematized, if the schools are strengthened with better-equipped teachers, we shall then see a better-equipped graduate and—shall we venture to say?—a better future in every respect.

Let us revert again to the question of the education of the public. This must be done in a more effective way than formerly, if the greatest good is to be realized. We are showing some healthy activity now in this respect, but it must go on more vigorously and in a sustained, methodical manner, if it is to function as it should. The recent Boston conference is the first real example of an achievement. Examination of the teeth of school children in various cities all show that there is a leaven doing its work. But this work is not for a few: it should be a general movement full of sympathy and altruism and carried on regularly all over the United States.

What we need first of all is greater unity and more thorough organization in every part of the land. In order to have greater unity we must have a broad individual element willing to overlook petty personal differences, so that we can successfully work for the common good.

When many forces and cliques work at random and in opposite directions, a lot of energy is completely wasted, and in the end there is nothing gained save misunderstanding and objection to this and that, while in all probability no objections should have been made in the first place.

After an objection has been made to a worthy object it puts it on the defensive ever after, and it takes a great deal of energy to carry on a defense. This energy might be used instead for a better purpose. In this matter of greater unity and organized effort we all see that a mere mushroom upstarting of activity will be of no avail. It means that a sustained struggle is before us.

Above everything else, then, we need a perpetual stimulus to our ambition in this direction, if we are ever to win out against the other rather well organized forces of the day, but still representing what we might call a hand-to-mouth existence in many ways.

We need some real deep thinking, an intensifying of ourselves, so that we can more perfectly understand ourselves, see ourselves in relation to the rest of the world, with a proper setting as it were. To bring this about in the rank and file in the present day we must have a more subtle force operating than those forces which have succeeded in establishing the present status.

CULTURAL VALUE OF DENTAL EDUCATION.

I said that more general culture is necessary for some general relief or understanding of things. It seems that in the past we have depended upon the cultural value of dentistry itself, at least this is true in regard to the majority of us.

This partakes of the Greek idealism to a certain extent, *i.e.* to grow up amidst beautiful surroundings and objects, so that this force should operate unconsciously. One drawback to this limitation on our part is that we do not often reach anywhere near the ideal of perfection in the majority of the patients' mouths. A beautiful mouth is as much a work of art as anything I know of. It should at least be so to us—it should inspire us very much as a beautiful painting or sculpture, or literature, does. If we are at all trained in the appreciation of beautiful things, we will realize more and more that this is true.

Another drawback to making dentistry our only cultural source is that, while it is an art, it is also our means of earning our daily bread; it is apt to become a drudge at times, and we are also dependent upon the temperament of our patients, giving us a limitation which we cannot always overcome. Years of association with beautiful mouths and cul-

tured patients will operate upon us unconsciously and produce its effect in time. Culture acquired in this way is very fine, but it is not quite broad enough for a complete social adjustment. I am afraid a little more activity on our part will necessarily have to be indulged in, if we are to be recognized generally as a cultured body. The ideal education for our coming youth will have started the student while he is in a more susceptible age, and it will be easy for him to continue when through his college course. What we want just now is something which will be of cultural value to the present rank and file. We know we can reach perfection in art, if we cannot do so in actual life. This is why existence often becomes sordid and painful; if we have no recourse outside of active daily toil, the situation is often hopeless. Furthermore, to indulge in some form or art and then to realize our ideals gives life a new lease, and it reacts upon our daily work with a most wonderful stimulus toward its ultimate perfection.

Of all the arts to choose from, which shall it be? is the next question. Generally, of course, the one in which we are most interested. I should choose literature for one, as the greatest in scope and latitude; it will make for completion, continually opening new vistas, always stimulating and refreshing, and when we become fairly well equipped we shall be possessed of a treasure indeed. We shall be more content with our lot, we shall see ourselves in proper relation to our fellows, we shall be broad in vision and judgment, we shall see the larger things and the necessity for united action in order to accomplish our mission to the fullest extent.

But we need not be limited to just one indulgence; we can of course indulge in all forms of literature, as for instance, the drama, which is the most expressive of all the arts. Music, the least expressive, but again the most thrilling, fills us with the most exquisite pleasure and stirs our emotion to the depths. It matters not what hobby of this kind we have, as long as we pursue it with some system, and aim for a certain completion, or, shall I say, strive toward a certain goal of perfection. If we go about it thus, we shall have the needed reaction upon our daily life and work. It will take a hold upon us eventually in an unconscious way, and we shall act in greater things as our ideals have been accumulating toward such end. I hope this illustrates what I expressed earlier—some subtle influence to make us think deeply, something which will intensify our personality. Other activities might do the same, such as travel, sport, etc., providing a certain perfection is aimed at, and this means a great deal of systematic study and investigation.

There is yet another way to bring about deep thought, viz, some real disaster to our entire body. Nothing will bring a nation or community to a sense of self-realization so quickly as a pending war, an earthquake, or any national danger, and it is the same with us.

Shall we be influenced by some subtle force, or must we be threatened with disintegration and disaster before we realize the importance of unity and organization to aid us in the healthy progress and the accomplishment of our mission?

If I have seemed pessimistic in these remarks, it is because I do not believe in the eternity of human ideals. But I am also an optimist, inasmuch as I fully and confidently believe in the ideal's power of propagation and development. Especially and definitely do I believe that the ideals of our time, as they pass away, are tending toward that grand utopian future for which we should all strive.

A SUSPECTED CASE OF LUDWIG'S ANGINA.

By H. R. SPARREVOHN, D.D.S., Los Angeles, Cal.

IN the DENTAL COSMOS for October 1909, I read with great interest "A Case of Ludwig's Angina Followed by Death," by Dr. Luigi Arnone, Florence, Italy—little expecting to be so soon confronted with what I consider a typical case of that affection.

Mr. S., whose family I have attended for years, but whose own mouth I never examined until lately, is fifty-eight years of age, robust, with no organic disease. His health has been perfect until about two years ago, when he noticed that hearing was deficient in his right ear. This difficulty increased, and was added to by a slight soreness of the throat. He consulted an ear, nose, and throat specialist, who prescribed a menthol spray, which was used for some time without benefit. About eight weeks ago the most violent symptoms developed, and another physician was called in, who ordered the patient to a hospital, where after a few days of great anxiety on the part of the physicians an abscess formed on the neck, which was opened, drainage being established.

In opening the abscess a strong odor of menthol escaped, and the menthol was given the blame for the whole disturbance.

The physician in telephoning to me about some other matter, casually observed that he had Mr. S. in the hospital with a serious abscess of the glands of the neck. I asked him whether he was sure the teeth were not involved. I told him that I desired to call on the patient, and permission was granted me to examine his teeth.

On calling on Mr. S. and ascertaining that he had never had any teeth extracted, it took only a glance into his mouth to tell that he had an unerupted lower right third molar. I informed the physician of my discovery, expecting him to be grateful for any information that might throw some light on the subject and help to make clear the diagnosis, of which he had expressed himself doubtful. In place of this I met considerable opposition, but was finally permitted to have an X-ray photograph taken at the hospital. At first a small film skiagraph was taken, which showed the crown of the impacted tooth (Fig 1). As this was not clear enough to satisfy my medical *confrères,* the patient, after gaining sufficient strength to leave the hospital, consented to go to the office of Dr. Albert Soiland, who, after several failures with small films held in the mouth, finally produced the plate of which Fig 2 is a reproduction. The exposure lasted twenty seconds, and produced a wonderfully clear image.

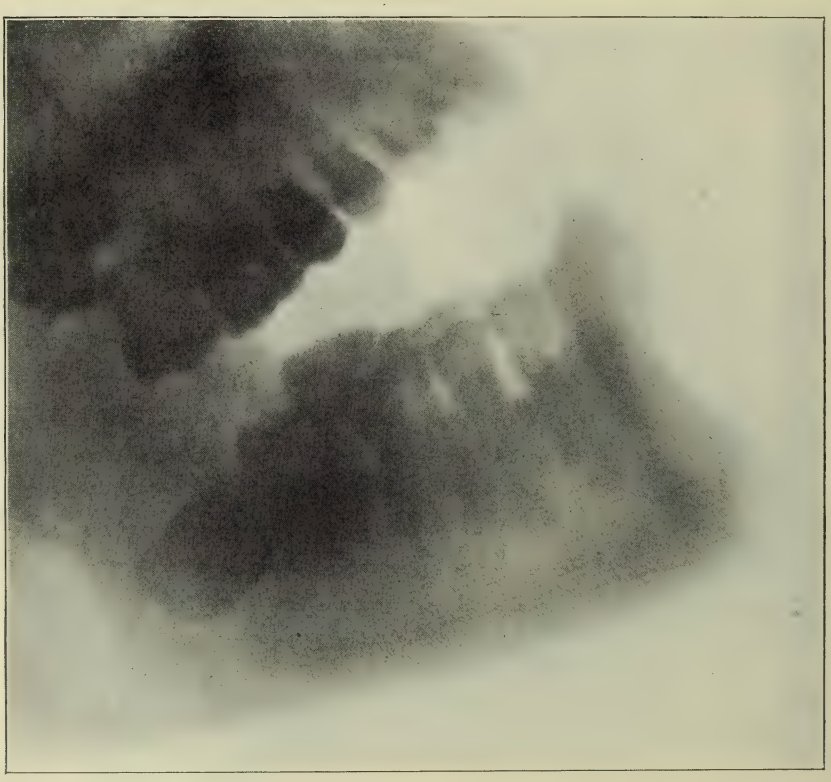
FIG. 1.



My diagnosis is still doubted, and Mr. S. has been discharged as cured, but if my contention is right, the symptoms will soon become violent again when drainage is stopped.

I should be thankful to readers of the Cosmos if they would express themselves as to the correctness of my diagnosis in this case. At present I am much discredited, especially by the medical men connected with the case, but also by the patient, who has been told that his tooth has nothing to do with the trouble.

Fig. 2.



ORAL HYGIENE AND AMERICAN DENTAL SCHOOLS.

By EUGENE S. TALBOT, Chicago, Ill.

"Certainly this is a duty, not a sin. Cleanliness is, indeed, next to godliness."
—JOHN WESLEY.

THE greatest problem which should concern the medical and dental professions alike is oral hygiene. In the prevention of disease more is involved in the proper care of the mouth than any other structure of the body, and this subject is now causing considerable discussion in all parts of the country.

The medical profession, taking it for granted that the oral cavity is solely within the province of the dentist, has been content to leave the care of the mouth entirely in his hands, hence this structure has not received the attention which it should. Since the care of the mouth is and always has been within the province of the dentist, the question naturally arises, What does the dentist know about oral hygiene, and how far does he fulfil his obligation to his patients? The only means by which this question can be judged is the current dental literature and the methods employed by dentists.

If the trouble be taken to read first a paper on oral hygiene published fifty years ago, and then the papers which have been written since then up to the present time, the ideas contained in the latter would, with one or two exceptions, be found to be copies of the original paper. In other words, little or no improvement has been made in the care of the mouth. If you do not care to take the time and trouble, then compare the pamphlet published in 1909 by the National Dental Association, namely, "The Mouth and the Teeth"—which is to be distributed by every dentist throughout the country to patients—with the first paper written upon the subject, and you will find not one original idea, paragraph, sentence, or word in this latest publication. The question is asked, Why was this pamphlet copyrighted?

The narrowness of the profession in regard to the subject of oral hygiene is displayed by the use of the terms "The Teeth," "Tooth-brushes," "Tooth-washes," "Tooth-powders," "Tooth-loosening," etc. These terms and "oral hygiene" are as foreign to each other as if they were two distinct species or belonged to two different professions. There is no harmony between them.

Even tooth hygiene itself is not understood, as witnessed by the various tooth-brushes, powders, and washes recommended and sold to the laity. The market is full of all sizes and shapes of handles and bristles, which are bought regardless of their adaptability to the mouth and teeth. Powders are manufactured by the ton, and consumed provided they taste good, and washes are made by the barrel, which have no effect upon the bacteria and filth of the teeth—all, however, are recommended for the purpose of stopping tooth-decay and the removal of tartar, bacteria, and filth. Do they accomplish the desired results? Do the brushes placed upon the market reach the desired places on the teeth? Do the powders remove dirt and tartar? Do the washes destroy the germs upon the teeth? Each dentist, if he stop to consider the matter carefully, can answer this question for himself. They fall far short of what they should, but are, however, an index of the present status of the dental profession. The fact that teeth still continue to decay, even after they have been filled, demonstrates that

in spite of the consummate efforts of the dentists of the country, tooth hygiene is a failure.

Unfortunately we began wrong end foremost by the establishment of the first dental school for the purpose of teaching students that all diseases of the body are due to a decayed tooth, and not that decay of the teeth is the result of local and systemic conditions. We are nothing but tooth carpenters, stopping holes and leaks, letting the on-rushing flood take care of itself. Every ill is due to some condition of the teeth, for which we recommend a tooth-brush, tooth-powder, tooth-wash that will tickle the palate of the patient regardless of the desired result; we repair the holes and leaks, and all ills are supposed to pass away.

Brush the teeth with brushes that do not reach the gums and the necks of the teeth and with bristles so soft that they produce no effect; use powders that do not remove the dirt and tartar; use mouth-washes that do not destroy the bacteria; use antacids for sensitive dentin, acid mucus, and saliva that do not destroy the systemic conditions causing them; plug holes in the teeth; have your patient return in six months or a year to see if the cavities have sprung a leak; extend crowns under the gum margins which set up interstitial gingivitis; insert bridges under which filth and bacteria play hide-and-seek; treat interstitial gingivitis only when pus and so-called pus pockets are present which are a result and not a cause; treat so-called pyorrhea alveolaris by the opsonic therapy, when a majority of the cases are due to local and constitutional irritation; use strong acids to reduce inflammation of the alveolar process which instead excite it; jab seventy-five to one hundred and fifty steel instruments into the inflamed alveolar process to remove the deposits and inflammation which but increase it; insist on brushing the teeth three times a day with brushes not adapted to the case, or, if the patient has not the time for this, once a day—that is what constitutes oral hygiene at the present time. We need no cider-mills to make mouth-washes; we require no chalk cliffs of France to make tooth-powders, or unskilled workmen and factories to make undesirable brushes. What we do require are laboratories in dental colleges presided over by thoughtful, educated men who can think, reason, and work out problems to revolutionize our present methods of practice. When the first dental school was established we dug a rut, which has grown deeper and deeper, and out of which we have never been able to extricate ourselves.

What is oral hygiene? According to Foster's and to the Century dictionary, "Hygiene is the science and art of the preservation of health." Gould says, "Hygiene is the science that treats of the laws of health in its broadest sense."

To coin a definition from these authorities, then, oral hygiene is the science and art of the preservation of the health of the mouth in its broadest sense. If this interpretation be correct, oral hygiene lies outside the sphere of the dentist, that is, the general care of the mouth is not within his province. The word "dentist" means one who cares for the teeth; the first dental college was established for the purpose of teaching the repair and extraction of the teeth and the insertion of artificial dentures. The dental schools today teach the same thing, hence it is that all literature confines itself to the science and art of the preservation of the health of the teeth. It will be seen, therefore, that oral hygiene in its broadest sense is not a part of dentistry at the present time. Neglected by the dental profession and considered outside the province of other medical departments, oral hygiene, the most important branch of medicine, has been the least investigated, taught, or practiced.

We are not to be blamed for our shortcomings in this respect. The fault lies with the teachers in dental schools. They have not kept in touch with modern research, but are teaching the same principles as were taught in the first dental college.

Not a dental school teaches oral hygiene. The dental student enters the

school, pays his tuition, and expects to be instructed in everything pertaining to his specialty. When he begins practice he finds that he falls far short of everything outside of tinkering teeth. The fact that hygiene is not taught and made a part of the specialty does not argue for its not being a part of the province of the dentist, who should devote time to the work, and charge for the treatment. The same amount of filth in any other cavity of the body as found in the mouth would necessitate treatment by a specialist, for which he would receive from three to five dollars per visit. If oral hygiene were taught as a part of the dental specialty, and the people were educated to the fact that it is just as important or more so to have the mouth in as hygienic a condition as the nose or vagina, thus in a measure preventing tooth-decay, loss of the alveolar process and teeth—rather than patching up the teeth, there would be room for three times the number of dentists as there are today, and the dentist would receive the same fees for the same class of treatment as other specialists.

Oral hygiene is considered of little moment by the dentist and of no account by a majority of the laity, hence little time can be given, and adequate charges cannot be made. Other specialists in medicine give their entire time and make good incomes on a practice which we have not developed, and of which we know but little. We have yet to learn the possibilities of our specialty. In a majority of people, the mouth is a reeking cesspool; pus germs and other bacteria are taken into the system through this cavity, producing disease. Filth in a cavity like the mouth is not only a menace to the individual himself, but to all persons with whom he comes in contact.

Who is to blame for this state of things? Every practitioner entering the profession today comes through the dental school. When he enters that school he knows nothing of what is expected of him as a practitioner. It is reasonable to suppose that what knowledge he possesses as a practitioner he has obtained in the dental school. Is it difficult to see where the fault lies? How can the dentist know anything of oral hygiene when he has never been taught, and his teachers, even, know nothing of it. The commercial side is always the important point in the school; there is no money in cleaning teeth and treating the oral cavity.

Considering the proper education of the student in oral hygiene, the essential question is, What conditions of the mouth require special attention? The mouth and tongue are the first to be affected by systemic defects. The principal reason is that the tongue, alveolar process, mucous membrane, and dental pulp are end-organs, while the alveolar process and dental pulp are also transitory structures, which are sensitive to faulty metabolism and autotoxic changes. To counteract these conditions the teacher and student should be medically educated, since systemic treatment is indicated.

The local manifestations are irritations, bacteria, bacterial infection, and inflammations. The local irritations should be all removed. I wish to reiterate what I stated many years ago and frequently since, that "Modern dentistry has produced more disease and filth in the mouth than any one thing, by the use of crowns, bridge work, and other irritating methods of repairing and substituting teeth." This is another illustration of oral hygiene ignorance.

An important mouth condition requiring special attention is interstitial gingivitis. This disease may be due to local causes, as irritations and infections, or constitutional causes, as faulty metabolism, auto-intoxication, and drug poisoning. This disease is always present, to a greater or lesser extent, in the individual, from the eruption of the temporary teeth until the permanent ones are shed.

The bacteriologic aspect is a serious one. Pus germs in any other part of the body produce grave conditions, but pus germs in the mouth are hardly considered of any importance by the dentist. They should never be present in this locality.

Gonococci, fusiform bacilli, spirochætes, leptothrix buccalis, with other pathogenic micro-organisms of more than fifty varieties, cause direct local action as well as systemic disease. Miller has shown that pneumococcus, diphtheria bacillus, tubercle bacillus, and the germs of children's diseases are also found in the mouth. Mold fungi are also found in large quantities. These germs are carried into the mouth by food, drink, and air. They thrive in a media peculiarly adapted for that purpose in the mouth environment.

The saliva and mucus become acid because of an acid condition of the system and diminished alkalinity of the blood. Kirk has shown that this acid condition causes precipitation of mucin or coagulation of the mucus, thus forming plaques upon the teeth at the gum margin, which hold and fix the bacteria of the mouth, thus causing cervical tooth decay. The gums become puffy, inflamed, and bleed easily; the ropy saliva, due to the coagulation, becomes very offensive in the mouth.

If oral hygiene mean anything, it means that the mouth should be put into an aseptic condition before any operation is performed, just as a surgeon prepares any tissue of the body for an operation. We have no more business placing our fingers or hands into a mouth that has not been thoroughly sterilized than the surgeon has to insert his fingers or hands into any cavity of the body that has not been thoroughly disinfected.

I have shown that we have been working at the wrong end of things. Having demonstrated wherein our faults lie, how can the defects be remedied?

This leads to the next question, How shall oral hygiene be taught in the dental school? Oral hygiene should be the first thing considered when a patient comes to the clinic or to our office; it should, therefore, be the first thing that is taught to new students in the dental school. It should be stated in lectures that the filth of the mouth is due to external as well as to internal causes. These conditions should then be taken up in their order, and it should be explained to the student, as far as possible, how each originates. This method should not require a special teacher, but should be a part of the work on pathology. The student having had two years in the fundamental branches of general medicine is capable of following the teacher without difficulty. The students, after hearing the lecture, should be required to enter the clinic and operate upon each other and upon the teachers. In this manner they can familiarize themselves with the structures and their sensations, methods of procedure, and of healing and restoring the mouth from an uncleanly to a healthy condition; they can also discuss the subject of procedure among themselves, and at the same time educate themselves in finger manipulation. There is not a student and hardly a teacher that has not an unhygienic mouth; this gives the student ample material for clinical experience before he begins treatment on dispensary patients.

He not only has had the experience as a patient, but can appreciate the feelings of his own patients as the treatment proceeds. In all dispensary patients and those who come to us for the first time, a quick-acting disinfectant, astringent, antiseptic, and germicide should be used.

My method of procedure since 1878 has been the following: Before placing the hands into the filthy mouth of a patient, with a long, thin wood applicator, around the end of which cotton saturated with iodin is wound, paint the mucous membrane, gums and teeth thoroughly. Hold the lips and cheeks away from the jaws and teeth until the iodin has dried into the tissues; then let the patient rinse the mouth with water. The applications of iodin are also for the purpose of reducing the inflammation in the gums and mucous membrane. The germicidal effects of the iodin have been known since the early eighties. The operation of removing the deposits from the teeth may then begin. All new patients with unkept mouths get this treatment in my office. My regular patients are treated after each sitting until the gums, mucous membrane, and secretions are restored to a healthy condition.

Iodin is the best quick-acting antiseptic, disinfectant, and germicide we possess; it acts immediately. It destroys all germs, including pus germs and their chemic constituents, lactic acid germs and ferment, and all other foreign and undesirable material in the mouth, thus preventing tooth-decay. It reduces inflammation and stimulates the tissues to lymphatic changes. It is quickly absorbed, thus destroying deep-seated germs, and reduces interstitial inflammation in the alveolar process. To obtain a suitable preparation for application upon the mucous membrane, gums, and teeth, I have prepared the following:

Iodo-glycerol.

Zinc iodid,	15 parts
Water,	10 "
Iodin,	25 "
Glycerin,	50 "

The object of this preparation is that by adding the glycerin it prevents the iodin from running about the mouth, and increases quick absorption. The official tincture of iodin contains seven per cent. of iodin dissolved in alcohol: the constant use of this preparation will irritate the gums, making them exceedingly sore. It is true, however, that a ten or twelve per cent. solution of the tincture of iodin will destroy all germs upon the surface of the skin and mucous membrane, but the constant application upon the gums will soon make the mucous membrane and gums sore, while a daily application of the iodo-glycerol may be used on most patients without difficulty. The frequent use of iodo-glycerol upon the teeth will destroy the germs, and by reducing the acid mucus and saliva to normal will assist greatly in preventing tooth-decay. It will also restore the inflamed mucous glands to health, but the causes which produce the inflammation must be treated constitutionally. In people, especially dispensary patients, with inflamed gums and alveolar process, ropy saliva, and rapid cervical decay, we can fill teeth continually, and nevertheless decay will appear about the fillings. Put the mouth in an aseptic, healthy condition, and decay will be much reduced if not wholly prevented.

When the saliva and mucus are acid and the cavities of the teeth are sensitive, the general system may be said to be in an acid condition. The acidemia can be further tested by the urine. The patient is given sodium bicarbonate and other alkaline treatment in some form three times per day. An excellent formula I have used for many years is:

℞—Sod. sulfocarb.,	gr. v
Sod. sulfate,	gr. x
Sod. bicarb.,	gr. xl
Colchin,	gr. $\frac{1}{250}$
Juglandin,	gr. $\frac{1}{3}$
Xanthoxylin,	gr. $\frac{1}{3}$
Synergistic aromatics q.s.	

Make in powder or granular form.

Sig.—One teaspoonful in glass of hot or cold water after meals.

By constantly testing the saliva and urine the stomatologist can tell when the system and secretions return to normal. The diet must of course be inquired into. Cathartics of different varieties according to indications may also be administered to remove the autotoxic condition. Plenty of water is necessary.

The operation of removing the deposits about the cervical margins of the teeth at the gum line may then be undertaken. Deplete the tissues of blood at the gum margin as much as possible. Always bear in mind not to carry the instrument up to the peridental membrane and alveolar process, thus injuring or infecting these structures with pus germs. After the visible deposits have been removed, give the gums another treatment of iodo-glycerol, allowing it to extend along the roots of the teeth under the gums. Make it a practice to use the iodo-glycerol on every patient at each sitting.

Pray for the salvation of the patient and his teeth and alveolar process from the dentist who "spends hours in instrumentation," jabbing about one, two, or more teeth, that his tormentor may pass from him. It is useless to pray for the tooth carpenter, who will destroy more alveolar process and mucous membrane

than the disease. He does not understand pathology; he was lost when he entered the dental school. He should have selected a trade where he could have shoved a plane or hoe in the garden, rather than a profession.

Make an appointment the second day after the first operation. By that time the gums will be contracted considerably, and more deposits can be seen and removed. Continue this method until the gums are healed. Clean and polish the teeth with the dental engine or otherwise, and make another application of iodo-glycerol. Pay no attention to pus or pus pockets if present. The process of repair and the iodo-glycerol applications will take care of them; the idea is not to injure, irritate, or infect the structures under the gum margin. Interstitial gingivitis extends throughout the gums and alveolar process. That this inflammation may be reduced and the structures restored to health, other procedures must be resorted to. A gum-massage brush and an astringent gum-wash are necessary to assist the iodo-glycerol in stimulating the parts, contracting the gums, and restoring the alveolar process to health.

A gum-massage brush should be made with a long tuft of bristles upon the end of the handle, with a wide space. The remainder of the bristles should be in groups of two rows each, with smaller spaces between and shorter than those upon the end, the object being that the end bristles should reach the gum margin in any locality. The bristles upon the inner surface will pass readily between the teeth, and thus reach the gum festoons and necks of the teeth. These brushes should be made of the stiffest bleached bristles—for the majority of patients the unbleached bristles are better; a soft brush will not do the work, and should never be used. In brushing and stimulating the gums and mucous membrane outside, the brush should be carried into the mouth and the lips closed. The bristles are rotated up and down as far as possible on the mucous membrane. The attention should be concentrated upon the gums and not the teeth—forget the teeth. The brush is then carried inside the jaws; the long tuft of bristles at the end will reach the gum margin throughout.

By the use of such a brush in the manner described, even the coarsest powders may be used and abrasion cannot possibly occur, no matter how soft the tooth may become from systemic conditions. In this manner, powders or washes will reach the necks of the teeth and gum margins, where they are the most needed.

The destruction of the alveolar process and gum tissue over the prominent teeth cannot thus take place to any extent. When interstitial gingivitis is present to a marked degree, the healing of the bone, gum, and mucous membrane naturally produces a contraction; thus the gums and alveolar process are never restored to their normal position. If the gum brush be properly constructed and properly used, better results will be obtained upon the teeth than in any other way, the teeth being properly cared for in the treatment of the gums.

The iodo-glycerol being used at the end of each sitting, all the germs are destroyed. A gum-wash is not only necessary on account of its astringent qualities, but it should possess germicidal and disinfecting qualities—for this purpose zinc sulfo-carbolate being by far the best. There are different methods of using this. A formula I have used for many years and one which I have given to the profession is—

℞—Zinc sulfocarb.,	gr. lx
Alcohol,	℥j
Distilled water,	℥ij
True oil of wintergreen,	gtt. viij

Many other drugs may be added to suit the taste—glycerin, soap tincture, and any of the essential oils. If a few drops are placed upon the brush and the gums are thoroughly massaged twice a day, the mouth will keep in a good condition. After the first two or three treatments, operations upon the teeth may be commenced. If, however, there are many cavities and the mouth is acid, it is better to continue the constitutional treat-

ment for a week or two before the cavities are excavated, when all pain will have nearly or entirely passed away. It is not a bad plan to fill the cavities with iodin when treating the gums and teeth. After each operation, give the gums a good dose of iodo-glycerol, until the patient is dismissed. By this procedure I have filled as many as thirty-two cavities in the mouth of a lady of twenty-eight years, who was recovering from a protracted illness after childbirth. She had been unable to have the cavities excavated by another dentist with local treatment.

It is good practice to have the patient put himself in the hands of the operator, and return every three months—never later than six months—for the iodin treatment to destroy the micro-organisms, reduce interstitial gingivitis, and to see that the patient is using the gum-massage brush and wash, and is properly caring for his teeth. Patients become careless and neglect some parts of the mouth.

The object of a tooth-powder is to remove as much tartar, dirt, and concretions from the teeth as possible. Most of the powders on the market contain French chalk and orris root. Such powders have little or no effect, since they will not remove the accumulations upon the teeth. Some gritty substance is necessary. There is nothing better than powdered cuttlefish, which will remove the filth and finally dissolve in the saliva. Chalk may be used for bulk; it will neutralize the acids in the mouth to a certain extent. Equal parts of powdered cuttlefish and chalk make an excellent powder. Other ingredients may be used to suit the dentist.

To give patients a powder or even a gum-wash with the idea that they will forever keep the mouth aseptic and free from all foreign substances is absurd. If the patient will carry out the treatment here laid down, tooth-powders could, in a measure, be done away with. To sacrifice the quality of a prescription to suit the taste of the patient is also absurd and unprofessional. This treatment should be kept up until the gums are hard, pink in color, and tight about the teeth. In some patients the treatment every other day, with the constitutional treatment when necessary, need be kept up for only a few weeks. In other cases a month or two is necessary. Every patient should return to the office at short intervals, at first once a week, to ascertain what progress is being made, and whether the patient is using the brush and wash properly.

Oral hygiene, then, should be more imperative than the plugging of cavities in the teeth. When this method of procedure has become the principal treatment of our patients, decay of the teeth will diminish and bodily disease will, in a degree, be overcome.

In all surgical operations upon the mouth, fauces, or throat, such as removal of tonsils, cleft palate or hare-lip, extracting teeth, etc., the gums, teeth, and mucous membrane should be treated to a thorough iodo-glycerol bath before operation. This method of treatment is modern and up-to-date, and must hold good until future discoveries demonstrate more perfect methods.

In conclusion let me offer the following suggestion: Since so much is now being said and done throughout the country in regard to oral hygiene in the public schools, would it not be well to "begin our charity at home," and put the dental schools in order first? Teach those entering the profession just how to care for their own mouths, then they will be able to care for their neighbors' mouths. Let us discard tooth-brushes, tooth-washes, and tooth-powders which are now on the market; let us build a foundation upon which a structure may be started strong and lasting; let the National Association of Dental Faculties at its next annual meeting pass the following resolutions:

First:

Whereas, like Rip Van Winkle, we having been asleep for more than twenty years; and

Whereas, we are now asleep;

Resolved, That we now wake up and get busy.

Second:

Whereas, oral hygiene being the most important factor in the health of the mouth and general system;

Resolved, That oral hygiene be considered a part of dentistry, and that it be taught the students in dental colleges.

Resolved, That all new teachers on biology hereafter entering our dental faculties shall possess a medical as well as a dental degree, having obtained the same by the continuous study demanded by our schools.

Third: Call a national meeting of the ablest men to discuss proper brushes, powders, and washes; have an intelligent, competent committee appointed to select a tooth-, or better a gum-massage brush, tooth-powder, a gum- or mouth-wash that shall be considered standard.

A proper brush can be used in Maine as well as Texas; a proper gum-wash is as appropriate in Alaska as in Florida; a proper tooth-powder can be used and recommended throughout the country. There should be no difference of opinion in the dental profession as to these standards. We can adopt fixed rules, and govern the methods of use which are applicable in college work, in infirmary work, in charity work, and for each and every individual.

TRIGEMINAL NEURALGIA AND NEURALGIAS OF MORE DEFINITE ETIOLOGY.

By HAROLD S. VAUGHAN, D.D.S., M.D., New York, N. Y.

(Read before the New York Institute of Dental Technique, February 24, 1910.)

BY neuralgia we mean a pain more or less paroxysmal extending over nerve-trunks and their branches. It is not a morbid entity, but a symptom, and therefore we must look for its cause.

In the analysis of a pain the patient should point out the spot or region in which it is felt, and specify whether it be deep or superficial. When the pain is radiating, it is necessary to differentiate between the painful focus and the peripheral radiations.

In order to determine the causative factor in trigeminal neuralgia, the origin, course, and distribution of the nerve should be kept in mind. The fifth or trigeminal nerve is the great sensory nerve of the face and the motor to the muscles of mastication. Its sensory division supplies the anterior part of the head, eye, nose, external ear, and mouth, including the greater part of the tongue.

From the side of the pons the two roots emerge; the large sensory branch passes forward into the Gasserian ganglion, while the small or motor root joins the lower of the sensory branches from the ganglion beneath the foramen ovale.

The three sensory branches from the ganglion are the ophthalmic and the superior and inferior maxillary divisions, which supply the areas indicated by their names. Thus we see the vast distribution of this nerve and the great possibilities for reflex disturbance.

Trigeminal neuralgia is of special importance, owing to the fact that it may be confused with pain arising from caries, from inflammatory, hypertrophic, and atrophic conditions about the teeth or their supporting or retaining structures, also from intranasal lesions, as interference with proper drainage of the various sinuses, pressure from deflected septa, or hypertrophied turbinates, errors of refraction, etc.

ETIOLOGY.

The etiology of trigeminal neuralgia is obscure; certain factors predispose, as age, and attacks are more common after middle life. Constitutional diseases connected with non-elimination of the products of metabolism or of toxins arising from acute and chronic infections also predispose; as examples, we might mention syphilis, gout, nephritis, malaria, and acute febrile diseases.

Among exciting causes may be noted its greater prevalence in cold weather, direct irritation of the nerve, as contusions, cicatricial tissue, constriction of bony canals or foramina by exostosis, pressure from newgrowths or gummata.

PATHOLOGY.

The pathology is not entirely clear. Sanger found the cells in the ganglion to be fewer, smaller and shrunken, with the nuclei indistinct or absent, and an increase in interstitial tissue. This has been verified in some cases by Horsley, Rose, Putnam, and others.

Changes in the peripheral nerves have been noticed in some cases of severe neuralgia. These consist of degeneration of the axis cylinders and their medullary sheaths. The symptoms are characterized by sudden paroxysmal attacks of pain along the nerve and branches, often brought on by muscular movement, as in eating, drinking, or talking. The patient may be absolutely free from pain or have only slight pain in the interval; the pain may be confined to one spot or spread over ramifications of the nerve. A characteristic symptom is tenderness along the course of the nerve or over the foramen of exit. There may be sensory disturbances, as hyperesthesia or anesthesia over the area of distribution. In other cases there are motor twitchings during the paroxysm, producing the characteristic tic douloureux; in some there are spasmodic contractions or painful cramps.

Secretory disturbances are often noted, as salivation and lacrymation.

The course is chronic, and the trouble may rarely disappear. The patient may be free from attacks for months or even years, but in typical cases the attacks become more frequent and last longer, until finally there may be no free intervals.

DIAGNOSIS.

In the diagnosis of trigeminal neuralgia it is important to note the paroxysmal character of the pain. Look for areas of hyperesthesia, tenderness over the foramina of exit, and also note if the pain is increased by muscular movement. Radiographs are often of great assistance in ruling out certain etiological factors. Owing to the fact that periods of improvement occur, the patient being free from pain for variable periods, we may be led to believe that the last method of treatment employed had been responsible for the relief, only to discover that the attack recurs with greater severity, and that it does not respond to the last method of treatment. The writer has frequently noticed this in cases that have been under his care. In his opinion one of the most important duties of the oral surgeon or the dentist in these cases is to protect the patient from needless loss of sound teeth.

TYPICAL HISTORY.

The following history serves to emphasize this point:

Mrs. A., seventy years of age, seen by the writer in March 1907, gave the following history: For the past three months she had been suffering from pain on the right side of the face, referred more particularly to the bicuspid region of the maxilla. In addition, paroxysmal attacks were produced by muscular movement, as in talking or eating. The examination showed hyperesthesia of the right cheek and tenderness over the infra-orbital foramen. The teeth were normal, except that two or three had been previously lost.

A diagnosis of tic douloureux was made. An X-ray examination was suggested, and the alcoholic injection was advised, both of which were rejected.

The subsequent history was learned from the patient's niece. After various consultations with other practitioners, it was decided that one of the bicuspids contained an inflamed pulp. Removal of this pulp failed to give relief. The tooth was later extracted, but without result; later other teeth were removed, the pain continuing. Following this treatment, a radiograph was taken, and a dense area of bone was attacked as a possible factor, but without success. Finally, after nearly two years, the patient received alcoholic injections, with complete disappearance of the pain.

The chief reason for this brief review is to show that it is always necessary to differentiate trigeminal neuralgia from pain arising from distinct pathological conditions about the oral cavity.

PULP-NODULES.

In this connection we must remember that only a small percentage of cases present symptoms. The diagnosis is at times very difficult. It is only when the nodules by pressure cause a congestion of the pulp, which in turn leads to a mild pericementitis with slight pain on percussion and sensitiveness to thermal shock, that we can be sure.

A radiograph will at times show their presence. The diagnosis must often be made by excluding other possibilities.

Exostosis is another cause which may act by producing pressure on a nerve, though most cases cause no symptom, and are discovered on extraction or by a radiograph.

EXUDATION CYSTS.

Exudation cysts that sometimes arise from a semi-inflammatory process around a pulpless root are at times a cause of indefinite pain. The writer has seen a case in which immediate relief from an intractable neuralgia followed the removal of an upper left first bicuspid root that was in relation with a cyst.

The pain arising in connection with sensitive dentin, pulpitis, apical pericementitis, and alveolar abscess need not be considered here, as their symptoms are of more common occurrence and more easily recognized.

MALPOSED AND SUPERNUMERARY TEETH.

Malposed and supernumerary teeth are frequently a cause, particularly in lower third molars in their relation to the inferior dental nerve. With a sinus leading to a non-erupted tooth caries usually extends rapidly, soon causing pulp exposure. The writer has recently seen four cases of persistent pain from this cause, two in connection with lower third molars, the third from an upper left third molar, the fourth from an upper left canine lying transversely in the canine fossa.

The following history is typical:

E. R., fifty-five years of age, has worn lower artificial teeth for the past five years. A year ago she noticed an inflamed area on the right side posterior to the plate, from which there was a constant discharge of pus. She paid little attention to it until two months ago, when she was seized with severe pain, referred chiefly to the auricular and temporal regions. These attacks were intermittent and worse at night. Examination of the sinus by probe showed what appeared to be a non-erupted third molar. This was confirmed by the radiograph.

Under ether anesthesia the overlying bone was cut away, and the tooth was removed. Examination of the tooth showed a carious cavity involving the pulp. Relief was of course immediate.

INFECTED ALVEOLI.

Non-suppurative infected sockets following tooth extraction are another cause of persistent pain, and may be due to retarded closure of the socket owing to the lack of sufficient blood-clot to aid granulation. Other alveoli may remain open owing to exuberant granulation or in connection with exposure of portions of the alveolus from traumatism or sloughing from irritating submucous injections. These small areas of exposed bone give rise to considerable reflex pain.

OTALGIA OF DENTAL ORIGIN.

It has long been recognized that pain arising from the teeth may be referred to other parts, as the eyes, frontal and temporal regions, and particularly the ears—otalgia of dental origin. A recent case seen by the writer was one of chronic alveolar abscess with marked pericemental thickening on an upper first molar associated with otalgia. In addition, pressure on this thickened area always produced a reflex pain over the upper part of the sternum and inner third of the clavicle. This pain disappeared on complete closure of the wound following amputation of the buccal roots.

ACUTE CATARRHAL INFLAMMATIONS.

A very important and frequent cause of pain referred to the upper teeth is that found in cases of acute catarrhal engorgement of the maxillary sinus associated with influenza. There may be constant pain, referred to the molars with soreness on percussion. These cases usually present acute catarrhal inflammation, non-suppurative in character. Transillumination and radiography are negative in diagnosis. The cases seen by the writer have cleared up without operative interference. By their recognition attacks on sound teeth have been prevented.

MENOPAUSE.

The mouth not infrequently shares in the reflex neuralgias associated with the menopause. The pain may be referred to a localized area or a tooth in the maxilla, then may suddenly change to the mandible, and is generally associated with occipital pain and vaso-motor disturbances. The pain in these cases is out of all proportions to any pathological conditions that may be present.

SUBACUTE PERICEMENTITIS.

Subacute pericementitis due to infection from the gingival margin may produce slight elongation and soreness of the tooth, and a referred pain which overshadows the local pain.

HERPES BUCCALIS.

Herpes buccalis is a source of pain frequently overlooked. It may occur independently of herpes facialis or labialis, and is marked by pain of one or two days' duration along the branches of a superficial nerve, followed by a vesicular eruption which produces a series of small painful ulcers.

CONCLUSIONS.

The subject-matter of this paper is based on clinical experience and is therefore incomplete, but in conclusion the writer wishes to emphasize the importance of a very careful study of the etiological factors in every case of neuralgia, endeavoring to eliminate the various possibilities.

If this is carried out, more accurate differential diagnosis between trigeminal neuralgia and other facial pains will be secured, fewer valuable teeth will be sacrificed, and many frequently overlooked conditions will be cleared up.

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PLEOMORPHISM AND THE PLEOMORPHISTS: A PLEA FOR FURTHER INVESTIGATION OF THE MICRO-ORGANISMS OF THE DEPOSIT UPON THE TEETH.

By THEO. VON BEUST, D.D.S., M.D., Dresden.

ABOUT two and a half centuries ago, when the gaze of pioneer investigators first wandered through those crude instruments which have evolved into those products of calculation and ingenuity which we today designate as modern microscopes, the public saw fit to ridicule the first conclusion, the theory of *contagium vivum,* reached by these fathers of the science of microscopy. Years have since elapsed, years of labor, characterized by perseverance ever animated by that inherent trait in man which prompts his searching for knowledge, and the world has become convinced of the validity of their views.

An inestimable amount of work has been accomplished, but more yet remains. We are but at the beginning; we are but removing the first stones which are impeding our path toward reality—a path which can only be smoothed by the individual endeavor of earnest workers. Will our profession lend its aid?

One thing which is apt to impress the young student of microscopy is the diversity of opinion regarding the interpretation of many phenomena seen under the microscope. Whole volumes are being written in the endeavor to elucidate some apparently simple matters of contention. An enormous amount of energy is being expended in trying to impress on the scientific world the plausibility of a theory which has as many opponents as it has followers. These differences are apt to instil in the mind of the young student—and, unfortunately, in the eyes of the public—a certain sense of mistrust. To the advanced student, however, who appreciates the inherent difficulties, these debates offer the greatest stimulus to further research. It is to one of these points of dissension that the writer wishes to refer.

Almost at the beginning of bacteriological research two factions found themselves at variance. The one, which we may term the old school, later represented by Naegeli, contended that most bacteria are pleomorphic—*i.e.* so variable in their form that their classification must ever be attended with the greatest difficulties. The other faction, which we may term the new school, represented by R. Koch, would not listen to pleomorphism, maintaining that the different kinds of bacteria are as constant in form as the representatives of higher orders of beings—that what once manifested itself as a bacillus would ever remain a bacillus.

The methods of cultivation as evolved by Koch and adopted by science have demonstrated that the anti-pleomorphists were, on the whole, in the right. The pleomorphists fell into discredit, and the assertion of a case of pleomorphism, as understood by the old authors, was received with the same amount of incredulity as a statement declaring a cholera bacterium to be a species of angle-worm. And thus things stand today.

So it came to pass that W. D. Miller, one of the first dental investigators who received the benefit of Koch's teachings and methods, reclassified those different kinds of microbes which were formerly considered pleomorphic micro-organisms (*Leptothrix buccalis,* Robin) into as many independent species of—*bacteria.* Representative men, inspired by Koch's teachings, willingly accepted Miller's classification.

In view of the above statement of facts,

why should we wonder that Vicentini, who by his wonderful investigations has corroborated many of the statements of the old authors concerning the pleomorphism of the micro-organisms of the mouth, has failed to receive the recognition which he justly deserves? To the initiated it has long become evident that the common representatives of the flora of the materia alba, although constantly associated with bacteria, are themselves not bacteria. An acceptance of this statement will at once dispose of the question of pleomorphism. Are we not intimately acquainted with the fructification forms of the oömycetes? Does the algologist question the identity of the gonidia of Cladophora, Œdogonium, or Ulothrix, merely because they do not resemble the parent organisms?

Two decades have passed since Vicentini's first publications, yet Miller's classification still remains! It is as deplorable as it is true that the dental profession is lacking in men who are willing to expend time and energy in the study of the organisms of the deposits found upon the teeth. Of the hundreds of papers read before the Fifth International Dental Congress, only one (the writer's own contribution) touched upon the morphology and biology of these forms.

It should be superfluous to emphasize the necessity of impressing the profession with the need for this work; the following passage, however, from the paper of Dr. N. S. Jenkins, read before the last great congress, may be opportunely cited:

> Modern dentistry has shown that the dangerous micro-organisms which cause such disastrous diseases as tuberculosis, typhoid, scarlet fever, diphtheria, influenza, pneumonia, etc., find their most favorable breeding-place in the mouth, lurking in the cavities of dental decay, lodging between uncleanly teeth, flourishing beneath the free margins of inflamed gums, permeating calcareous deposits, causing the fermentation of particles of food wherever lodged, rioting in viscid mucus and desquamated epithelium, covering the tongue with a lace-work made by yeast-forming bacteria in which more formidable organisms find domicile, and quickly changing the pure flow from the salivary ducts into a stream of defilement.

A broad field is open for the dental scientist—for this is his very sphere.

CORRESPONDENCE.

THE RELATION OF THE INDIVIDUAL PRACTITIONER TO FREE DENTAL SERVICES.

To the Editor of the Dental Cosmos:

Sir,—From his paper as published in the April Cosmos (pages 444–56) it seems to be the opinion of Dr. Wm. W. Belcher that it is the duty of the dentists of this country to establish and maintain free dental clinics in all large cities and towns; he censures them for not having done so long ago, and even ridicules them as dispensers of charity, stating that as such they are "a joke." I want to take exception to this charge.

As an individual, the dentist is no less a dispenser of charity because he is a dentist—and I am sure I can personally cite more cases of charitably disposed dentists than can Dr. Belcher to the contrary. As one instance, let me mention a large home for incurables in one of our southern cities, that pays for the services of its "internes," its nurses, student nurses, and visiting staff, yet this institution had for six years, to my knowledge, the free services of three dentists—one afternoon a week. There was money (small pay in some cases, but pay it was) for everyone serving in that institution except the dentist. When after two years of such service one of these dentists, because of growing demands in his private practice, was compelled to give up the work, and was asked to recommend a successor, he petitioned the board of managers that they offer for such services as the institution needed the sum of two hundred dollars per year; that a young practitioner could then feel he was receiving a slight compensation for the skilled services for qualification to render which he had worked hard and had in many cases paid a good fee for his instruction. The board replied that there was no money available for dental services, and that the only compensation they could offer was the prestige that resulted from association with a staff of reputable physicians. Cases very similar to this occurred in two of the largest hospitals in New York city. Now, all this points to the fact that a dentist should be paid for his services just as readily as are the nurses and physicians.

Dr. Belcher considers that the dentists, by their subscriptions and by their services, should establish and maintain these clinics. Now, I contend that these dental clinics should be maintained as are our medical clinics—that is, by public subscription, or appropriation by local or state legislation and by philanthropic endowment; and that if the public and our legislators have failed to include dental along with medical services, Dr. Belcher and others ought not to heap abuse on the heads of the fraternity for the sins of omission of others. He is right in establishing these dental clinics in any manner he wishes, but should not condemn the profession for not doing what is distinctly a general or joint duty, not a responsibility incumbent solely upon them.

How many public hospitals in our cities were founded and are maintained by subscriptions from physicians? True, many physicians do give their time and services to the hospitals—but, again, are they not used for clinical instruction of the students of the very medical colleges in which the so-called public-spirited physician lectures?

Now, none of this criticism is intended to belittle in any manner whatever the excellent work being carried on in these public dental clinics, but only to

protest against these gentlemen, in their enthusiasm, condemning those dentists who do not do as they wish. It is but a step farther to that cry recently uttered by the editor of one of our journals, in which he in some circuitous manner held this same dental profession guilty of the suffering and death of seventy millions of people because all dentists would not stop practice and teach the masses "how to live" according to the dictates of that journal.

As to the need of dentists in penal institutions, the matter is purely a case for legislation, and the needed reform should be effected through the activity of state and local societies.

Sincerely yours,

WILLIAM C. FISHER.

NEW YORK, N. Y., April 20, 1910.

DR. TALBOT AND THE MEDICAL *IGNIS FATUUS*.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Dr. Talbot has won for his name a place on a separate tablet on the walls of the temple of Dental History. He has gained this coveted distinction by years of unselfish work in the field of dental pathology. His original investigations have helped to advance the status of the profession and of the individual dentist, scientifically and socially. We all honor him for his valuable service in the cause of dental science.

But how can we account for the recent contributions from his pen, with fantastic titles, which have appeared in dental journals? I refer to his "Swan Song" and "Rip Van Winkles in American Dental College Faculties" articles.

What ails the author of "Interstitial Gingivitis" and of numerous strictly scientific contributions to special dental pathology?

I once heard Dr. Talbot say on the platform, in the presence of a large audience, that the only organ in his own body that gave evidence of "degeneration" was his *liver*. Are "Swan Songs" and "Rip Van Winkles in American Dental College Faculties" to be taken as symptomatic of that hepatic degeneration? One could not expect them to emanate from well-balanced gray nervous tissue. They are illogical, because they are marred by ludicrous misfits of premise and conclusion—such as, "All dental college professors are Rip Van Winkles; therefore, wake them up and teach them *anatomy* . . . . The degree of M.D. would make them fit professors of a mechanical and artistic specialty of surgery."

When we really give thought to the matter of relationship, the only thing in common between the two distinct professions, medicine and dentistry, is the soil from which they spring, and upon which they both have grown and are growing—I mean biology. Both professions, as any thoughtful, logically educated man can see, have their roots in biology. Biology, in its departments of histology, embryology, physiology, pathology, and bio-chemistry, belongs to dentistry as well as to medicine. Dentistry is not a branch of medicine nor is it grafted upon medicine, but is a separate plant from the same soil in which we find medicine and surgery growing. This basal soil, biology, is as well cultivated in dental as in medical colleges, and the cultivation is as carefully adapted to the special plant.

Can you detect any signs of incompetence in the past labors of "Rip Van Winkles in American Dental College Faculties" when you contemplate the wonderful progress in the science and in the art of dentistry during the last half-century?

If the dental faculties have been asleep in the professional Catskills for twenty years, who has been plowing and weeding and trimming and tending with infinite labor and intelligent care this den-

tal tree during that time? A tree is known by its fruit, and the fruit on our tree is developing year by year, with most hopeful signs of a complete final ripening. Has all this work been done by the insignificant minority of gardeners who, somewhere in the past, have by attending a medical college for two winters—or, as in some cases, have rather "by hook or by crook" obtained the degree represented by "M.D."? More than forty years ago, to be personal, I was offered the degree of M.D. from two reputable medical schools. I respectfully declined either, because even then, in my youth, I felt as I do today—that as a degree the "Doctor of Dental Surgery" was more appropriate for a dentist, and that it was honor enough, and would require all of my earnestness and striving to become worthy of and maintain with dignity.

As the years go by, my estimate of the respectability of the occupation, as well as of the science and the art of the dentist, rests upon a broader basis of *facts*.

I have no sympathy with the men who want to become members of a medical association, and to be placed in a separate section named Stomatology, which is placed in a corner by itself, and which humbles itself like Uriah Heep, and cringes and rubs its hands and bows, hoping to be recognized by members of a separate profession developed from the same soil, and with very much the same ancient history of rebuffs and snubbings. A society which requires the M.D. degree for membership is no place for a dentist.

A law which requires an examination from a state *medical board* before a D.D.S. can practice his special profession is not only an open insult to the reputable dentist and his profession, but is as ridiculous as would be the adoption of a law requiring the applicant to pass an examination in theology before a board of doctors of divinity. Such a law would be no less foolish and unreasonable. As an unjust law, it would be unconstitutional and contrary to the spirit of our laws. Dr. Talbot has revived the terms "tooth carpenter" and "plumber" as applied to modern dental surgeons. The next step of some unwise legislator may be to insist that dentists shall serve an apprenticeship, and obtain a plumber's license. We are sufficiently related to the plumber, I am sure; for in German a tooth is *plombirt*, and in French a filling is a *plombe*. The plumber would make as intelligent an examiner for a dental applicant as would a doctor. I say this with absolutely no disrespect for the practitioner of medicine, as a physician, as a friend, as a consultant and a co-laborer in certain oral and dental diseases. It is not the medical man who wants such foolish laws passed. It is the dentists themselves, the dentists with unbalanced minds.

The dentist has a degree which does not stand for "partial culture," unless we consider the M.D., the D.D., the LL.D., and the Ph.D., to be of the same rank. Who believes that an M.D. is a universally cultured man? The degrees signify that the individual entitled to one has completed a course of study in a certain branch of knowledge.

Medicine is not the alma mater of dentistry. She has been called so by dentists, but she never was a fostering mother. To be sure, in the early days some physicians, having a taste for mechanics and minor surgery, furnished themselves with a few tools from some neighboring dentist and began *plugging* various cavities with tin foil, *lead*, etc., and gradually crept up from this low standard into the ranks of dentistry of that day. Broken-down ministers of the gospel have done the same thing, and perhaps a greater number from that than from the medical profession have practiced primitive dentistry. We could then with equal reason call theology the alma mater of dentistry.

The Talbots of dentistry have been, from the beginning, possessed with the idea that the dentist must be like an ivy vine and cling to something in order to grow and thrive, while the present position of the profession, its past brief history, its present organization—its journals, its colleges, its societies, and its state examiners—all furnish clear evidence that it is a separate, a distinct, and a self-sustainingly upright profession.

It cannot in any sense be classified as a parasite.

The men among us who are striving for the annexation of our colleges to medical schools connected with universities, and who are struggling with state legislative committees for examination by a medical board of state officers, before the dental applicant shall be left to dental examiners and dental laws, are conspirators who would take the life out of dentistry. Those of us who have in all innocence begged for the establishment of *dental chairs* in medical colleges are really playing with a fire that will some day consume our dental self-respect and do the independent profession infinite harm.

Yours respectfully,

C. M. WRIGHT.

CINCINNATI, OHIO.

PROCEEDINGS OF SOCIETIES.

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

Tenth Meeting—Paris, March 25-27, 1910.

As preliminary to the report of the International Dental Federation meeting, we give the following brief reviews by French *confrères,* Dr. Maurice Roy, secretary, and Dr. G. Villain, assistant secretary F. D. I., reflecting the generous enthusiasm characteristic of the hosts at the feast of good things presented in the interesting and successful series of meetings held at Paris in March last:

Brief Review by the Secretary.

FOR the tenth time the International Dental Federation has assembled, the meeting being the first one of its third period, inasmuch as it automatically reorganizes at every international congress. Accepting the invitation of the French National Dental Federation, the F. D. I. held its reunion in Paris, where ten years ago it was founded at the never-to-be-forgotten Congress of 1900. As in every preceding year, we have had the pleasure of seeing assembled in this great Federation the most noted representatives of dental science and art of different countries, and we have been fortunate in having with us these devoted colleagues, who come from the most distant countries in order to work for the general interests of our profession.

Owing to the Fédération Dentaire Nationale and the activity and devotion of our esteemed *confrère,* M. Francis Jean, it may be said that the Paris reunion has been second to none of the preceding reunions held by the F. D. I. in various countries. We have had the pleasure of having the Minister of Public Instruction, the Rector of the University of Paris, and the learned physiologist Professor Dastre, give their valuable patronage to our beloved Federation.

It was in our illustrious Sorbonne that the opening meeting was held, in the Richelieu amphitheater, which was very kindly put at our disposal by the rector, and Professor Dastre has given us the priceless support of his authority in his memorable address, which will be read everywhere, and in which he showed both

the technical and practical needs of our art and the drawbacks to its engaging in services of secondary importance.

The F. D. I. has been welcomed by the Municipal Council of Paris, which, through its vice-president, M. Miniot, congratulated us on the work that has been accomplished and the aims that are being pursued.

Finally, the Federation at the close of its work has taken part in the public glorification of one of our most illustrious *confrères,* Horace Wells, the discoverer of surgical anesthesia, in whose honor the dentists have erected a monument in a public square in Paris. These are the crowning points of those two short days, altogether, during which the F. D. I. has pursued its work.

An extremely important event was the award for the first time of the international Miller prize. It will be remembered that in 1907, following the death of the much-lamented Miller, the F. D. I. decided to open a subscription in order to commemorate this great scientist by the establishment of a biennial prize to be awarded to the man who has done the most for our profession. The Executive Council of the F. D. I., constituting the jury to decide on this prize, has awarded it to our illustrious *confrère,* Dr. Black of Chicago. This choice will be universally indorsed, for by it the labors of an entire life devoted to work of the utmost interest to our profession, and the contributions which have added considerably to the progress of our art, have been rewarded. A full account of this session will be rendered later on. Suffice it to briefly mention some of the interesting points that mark an epoch in the history of the F. D. I.

Under the wise and energetic direction of its new president, Mr. Paterson of London, the Federation took up current business, reorganized its commissions and prepared its working plans for the next year, when a regular meeting will be held in London, in the month of August 1911.

We take pleasure in noting the success of this great reunion; from these gatherings the International Dental Federation emanates greater and more prosperous in the interest of the greatest present and future benefit of our profession.

MAURICE ROY, *Secretary.*

By the Assistant Secretary.

IF on the whole map of the world the spot which marks our country stands forth most brilliant; if the scholars of both hemispheres realize that this generous country has as its highest ambition that of putting its intelligence and its powers at the disposal of progress and of humanity; if all that is said about this country outside of its borders is true, then the French dentists themselves must be promoters of the international professional movement—and indeed in this they have not failed.

"Paris, cradle of the F. D. I.," were words often uttered by our foreign *confrères,* evoking in oneself an indescribable joy and pride. The F. D. I. owes its origin to the initiative of a French odontologist; its first and most difficult steps have been directed by our men. Those who today have taken charge of its management turn to the promoters of the idea, and the former presidents, with the assurance of finding from them the encouragement, the support, the advice which such a difficult task requires. Our eyes are turned to our masters in full confidence.

After having had a dental ramble for ten years all over the world, the F. D. I. has come back to hold its tenth session in Paris, whence it started in 1900. It has come back powerful, honored, elevated. Those who at the time of its foundation had expressed some doubt as to the possibility of its work, those who later on without proofs or reasons tried to cast suspicion upon it, have been enabled to recognize that the F. D. I. has been and is alive—that, owing to the tact and the moderation with which it has been conducted by its presidents, it has become an indispensable instrument of the progress of the profession, by reason of its function as the international consulting committee.

The F. D. I. has found new power and inspiration in its home, Paris. It desired to show what it has become; it has been hailed with enthusiasm and its directors have been able to leave our soil convinced that they had back of them the support of all thinking France, and that if, in order to pursue the work, new energy were required, they could come here to find it.

After returning from the Fifth International Congress held at Berlin, I voiced my impressions of the International Dental Federation in the following terms: "In the meetings of the F. D. I., I spent the best hours of my sojourn in Berlin, and I wish with all my heart to impart to my *confrères* a little of my enthusiasm for the perpetual welfare of the F. D. I. If by these few pages—which were dictated with the sentiment that I was fulfilling one of the most delightful duties—I have succeeded in demonstrating the usefulness of the F. D. I., if only to some *confrères,* my joy will be immeasurable."

The F. D. I. has held its tenth meeting in Paris, and as was to be expected, our French *confrères* have appeared in great numbers. We gladly express our debt of gratitude to the public authorities of the University of the city of Paris, which kindly tendered the F. D. I. a reception worthy of that select professional body. The University of Paris generously put at our disposal the Richelieu amphitheater of the Sorbonne. Two hundred *confrères,* forty among whom were foreigners, attended this memorable meeting, which was presided over by Professor Dastre. The Minister of Public Instruction, having accepted the honorary presidency, officially delegated M. Dastre, member of the Institute and of the Academy of Medicine, professor of general physiology of the faculty of science of the University of Paris, who presided. This is the first time that the French government has been officially represented at the F. D. I., and we cannot attribute too great importance to this representation, and especially to our minister's felicitous choice of Professor Dastre. The reading of the minutes and of the address delivered by that eminent physiologist proved what a lively interest the public authorities take in dentistry, and that they have confidence in our science and are willing to help us.

Neither did the municipal authorities of Paris wish to seem indifferent to this international professional manifestation. The address of M. Miniot, vice-president of the Municipal Council, on the evening following the close of the meeting, and that of the representative of the prefect of the Seine, have proved to us their interest, and what is more, they have given us the assurance that the aid of the city of Paris will be given to us in order to pursue the work of oral hygiene which the progressive Hygienic Council of the F. D. I. is carrying on so assiduously under the direction and the authority of its distinguished president.

In their sessions, the Commissions on Hygiene and Education, after convening a quorum, prepared the program for the third quinquennial period of the Federation.

The Executive Council had the pleasant duty of awarding the Miller memorial prize, which each two years is to be given to the person who has rendered the most eminent services to our profession. The candidate proposed by the French national body, the "F. D. N.," withdrew, and we here compliment our distinguished *confrère* upon his tact. Dr. Black of Chicago was awarded the prize. Certainly no better choice could have been made, and it reflects all honor upon the jury of award.

Without here going into the details, the subsequent reports will permit the reader to appreciate the work of the F. D. I. during this meeting, and I take pleasure in believing that the Federation has done more than merely professional work—that it has had the good fortune of doing social work in Paris. In fact, by its coming to Paris the F. D. I. has done more than working for the progress of our profession, it has done more than making itself and its aims known to the public authorities, and demonstrating to them what is expected from them in order that these aims be realized. It has

shown that the work toward peace in the realization of which our country and its greatest minds have been engaged is not utopian. It has proved itself to be one of the most valuable means for bringing about cosmopolitan citizenship.

By the Municipal Council our representatives were congratulated upon the work which they have undertaken, and at the banquet, especially, one of our esteemed ministers, a man whose authority in these matters is undisputed, M. Mesureur, director of the bureau for Foreign Affairs, characterized our international work as a most fruitful enterprise. He said: "You have set an example, gentlemen, and this evening I wish to thank you for it. That all men are united, by their work and their profession, in the pursuit of progress, in the perfecting of science, and the welfare of all humanity—this lesson your international professional federation teaches us. It becomes our duty to follow you, and to bring it about that, like you, each one in his field of work direct his efforts toward the alleviation of suffering and the harmony of all peoples." And proudly M. Mesureur added: "The teeth of which you so fondly take care—they have no nationality; and the smiles on your faces, ladies, they have no fatherland."

Do these words not coincide with the thought, the impression which I put into words in my account of the Fifth Berlin Congress? "All professions should have their 'International Federation,' so that all men might learn to know each other better and to love each other; and the office, the laboratory, and the book will become the glorious weapons of peace, stimulating the energy and encouraging the co-operation of all on the road to progress, and strengthening humanity instead of decimating it."

All this progress, the report of which I would advise you to read, we owe to the F. D. N., which the members of the "Syndicat" chose to call our chimera! Are you now convinced of the existence, of the aims and the usefulness of this body? You who would monopolize dental ideas and their safeguarding, what were you doing on March 25th to 27th? also why did you ignore the Berlin Congress and its 2000 attendants? It is true that you could not find any motive to go there and pour out your anger, prompted by personal ill-will, like the toads in Rostand's latest play. By your fruits you shall be known, ye "blind polemicists." You will give me another chance—thank you! I can find only one excuse for you—the F. D. N. has prepared all this without much noise. Great things do not need the din of big drums.

G. VILLAIN, *Assist. Secretary.*

Summarized Report of Proceedings at the Paris Meeting.

THE F. D. I. held its tenth meeting in Paris on March 25 and 26, 1910. Eleven nations were represented—Germany, England, United States of America, Chile, Denmark, Spain, France, Holland, Italy, Sweden, and Switzerland. Twenty members out of fifty of its Executive Council, and as many members of its commissions were present. The French F. D. N. had previously held three sessions in order to prepare and organize the reception of the F. D. I., and had nominated a committee for that purpose. The published program was adhered to with only slight modifications.

Thursday.

On Thursday, March 24th, at 9.30 P.M., an informal reception was tendered by the F. D. N. to the foreign members of the F. D. I. at the Mollard Café.

Friday.

Friday morning, March 25th, the opening session took place at ten o'clock in the Richelieu amphitheater at the Sorbonne, which was kindly put at the disposal of the F. D. N. by the rector of the University of Paris. About four hundred persons attended. The meeting, which was held under the honorary presidency of the Minister of Public Instruction, was ably conducted by M. Dastre, professor of physiology of the Faculty of Science, member of the Institute of France and of the Academy of Medi-

cine, who was delegated by the minister to represent him.

The meeting was opened by an address by M. Francis Jean, president of the French F. D. N., which will be found below. Then followed the English address by Mr. W. B. Paterson, president of the F. D. I. Then the various foreign representatives took the platform, speaking either in English or in French, with the exception of Professor Jessen, who spoke in German but whose address was directly translated and read in French.

Professor Dastre delivered the closing address, which with the other addresses here referred to will be found later on in this report.

Friday, 2.30 P.M., the session of the Executive Council was held in the quarters of the F. D. N., at the building of the Sociétés Savantes, 28 rue Serpente, under the presidency of Mr. Paterson. The program of this session, which lasted three hours and of which a report is to be found later on, was adhered to and completed without difficulty under the methodical management of Mr. Paterson.

At this session the Executive Council, acting as jury, awarded for the first time the international Miller prize, consisting in a diploma, a medal, and the interest from a subscription raised in different countries. The jury accorded this high distinction to Dr. Black of Chicago, who is so well known in the dental profession by his numerous and learned works. Dr. Kirk was commissioned to convey to him the good news by telegram.

At 9 P.M. a concert, arranged for by the F. D. N., was given at the F. D. I. Hall at Eylau, 101 Avenue Victor Hugo. About three hundred persons in evening dress listened to and applauded the distinguished artists, who offered a varied and very fine program.

Saturday.

Saturday, March 26th, at 9 A.M., the members of the F. D. I. visited the Dental School of Paris and the Odontotechnical School. Then the Commission on Hygiene, chairman Professor Jessen, and the Commission on Education, chairman Professor Kirk, held separate meetings, the transactions of which will be found later on in the detailed report.

On Saturday, 2.30 P.M., the second session of the Executive Council was held, and the order of business transacted. The proceedings of this meeting, which lasted four hours, will be printed later. It is to be noted that the Executive Council decided to hold its next meeting in London in 1911.

At 4 P.M. the F. D. I. went in a body to the City Hall, where they were formally received by the bureau of the Municipal Council. After being welcomed by the vice-president of the council the members of the F. D. I. were invited to inspect the halls of the municipal building.

AT THE BANQUET.

At 7.30 the F. D. N. gave the F. D. I. a banquet at the Continental Hotel, in one of the largest halls on the first floor, which was decorated with banners for all the nations represented. The table, with 102 covers, was decorated with flowers. About thirty ladies were present. The band of the 128th Regiment, generously detailed by the military authorities, executed some brilliant pieces during the feast. Messrs. Paterson and Francis Jean presided at the center of the table. The Director of Public Charities honored this elegant reunion by his presence. At the dessert course Mr. Paterson proposed in English the health of the President of the French Republic, and the band played the "Marseillaise." Then Dr. Eudlitz read the letters of regret. A comprehensively worded toast was proposed by M. Francis Jean.

Dr. Godon, honorary president of the F. D. I., briefly traced the results obtained during the ten years of existence of this professional organization, recalled its development, mentioned the aid which it has found, and congratulated himself upon seeing at the table the most influential officer of the French professional institutions.

M. Mesureur expressed to Dr. Godon his thanks for his allusions to his efforts for the development of dental science.

His aid, he said, rendered possible the earnest enthusiasm with which this profession is inspired; he had simply followed their example, and M. Godon himself had inspired him to do what he has done. He said that the Frenchmen present at the banquet regretted being able to speak only one language, but they trusted that their foreign guests would comprehend the deep fellow-feeling which they had toward them. He expressed his thanks to the foreigners for having come, and added: On beholding you, ladies, we realize that smiles have no country. It is to be hoped that we shall bend all our efforts to the conquest of art and beauty, and to the extinction of suffering. There are thousands of individuals who need your care. I propose "The advancement of dental science and the health of the French dental profession."

Mr. Guy gave a toast in English to Dr. Black, who had been awarded the Miller prize. He congratulated himself upon the choice of a man who has rendered to the dental profession such eminent services. The band played the English national anthem.

Dr. Kirk expressed thanks in English for the honor bestowed upon one of his countrymen, but said that he was not surprised that a jury of his peers should have found Dr. Black worthy of the Miller prize. Although Black belongs to America by nationality, he belongs to the whole world by his works. The titles of his productions cover no less than thirty-five octavo pages. The band played the American national anthem.

Dr. Quintéro, member of the American Dental Society of Europe, offered as representative of that society a toast in English to the F. D. I.

Dr. Aguilar gave a toast in French to the ladies, who have always assisted the members of the F. D. I.

Dr. Siffre gave a toast to the foreign *confrères*, to the French colleagues, and to the King of Sweden, as the patron of the Commission on Hygiene.

Dr. Lenhardtson gave a toast in English to the members of the F. D. I. in Denmark and Sweden.

M. Grimaud gave a toast to the heads of the nations represented at the banquet.

Dr. Subirana extolled in Spanish the glory of Horace Wells, whose biography he traced in a few felicitous sentences, congratulating France on having erected to him a monument which is indeed a monument to the dental profession.

Mr. Brooks, president of the British Dental Association, expressed thanks in English for the reception tendered by the F. D. N., and remarked that this reunion served to bring the different nations together more closely.

Dr. Rosenthal compared the arrangement of the table with the image of a better humanity. As the diners represented the different nations, he proposed to drink to the fraternity of all peoples.

M. Barrié said that the first fatherland of the French dentists is France, but that their second one is America, where their profession has been perfected. He asked the members to appear in full number the next day at the Horace Wells statue.

The toasts were closed. On leaving the table Dr. Kirk read a telegram which had just been received from Dr. Black, in which he expressed his appreciation of the honor bestowed upon him.

The members then attended the *soirée* and ball given by the American Dental Club of Paris to the American Dental Society of Europe, assembled in Paris coincidently.

Sunday.

On Sunday, March 27th, at 10.30 A.M., the members of the F. D. I. assembled at the United States Square to attend the unveiling of the monument erected in honor of Horace Wells by the French committee. The ceremony took place under the patronage of the President of the Council, the Minister of the Interior, the Ministers of Foreign Affairs, of Public Instruction, of the Academy of Science, and of M. Gérente, senator and mayor of the sixteenth district. Several speeches were made, notably by Professor

Dastre, representing the Minister of Public Instruction. A special tribute of thanks and of congratulation is due to the organizers of this reception to the F. D. I., especially to M. Francis Jean, the president of the F. D. N., who liberally gave his time to the organizing of the open session and succeeded in securing a president, a hall, and a ministerial delegation, was instrumental in bringing about the reception at the City Hall, and, to a marked degree, the unveiling of the Horace Wells monument. Messrs. Barden, Eudlitz, Richaume, and G. Villain, who had charge of the banquet, deserve high praise for the pains taken and the thoroughness with which they managed that affair. Finally, M. Grimaud, who had charge of the arrangement of the concert, is to be congratulated for his great ability and good taste.

It is a great pleasure for us to express our sincerest gratitude to the members of the American Dental Society of Europe, also to the American Dental Club of Paris, for the sympathetic interest which they have shown by devoting some hours of their meetings, which were held at the same time, in attending our sessions and celebrations. We especially thank Dr. Jenkins, president of the American Dental Club of Paris, Dr. Quintéro, president of the American Dental Society of Europe, also Dr. Hirschfeld, the organizer of the brilliant evening at the American Dental Club of Paris, and who has very kindly given us a report of the reunion of the American Dental Society of Europe. Dr. Robinson deserves our recognition for the devotion and tact with which he has fostered cordial relations between the American societies, the F. D. I., and the F. D. N. Our *confrère* has again given us proof of his extreme courtesy and friendship. G. Villain.

Unveiling of the Monument to Horace Wells.

On March 27th the inauguration of the monument to Horace Wells took place at the United States Square on the Avenue de Jena, under the patronage of the Council, the Ministers of the Interior, of Foreign Affairs, and of Public Instruction, of the Institute and the Academy of Science, and of Senator Gérente, mayor of the sixteenth district.

This auspicious occasion was favored by beautiful weather, and the attendance was very large. Among those present were noted the delegate of the Minister of the Interior, George Berry; M. Gérente, senator and mayor of the 16th district; M. Laurent, representing the prefect of the Seine; Professor Dastre; Dr. Jenkins, president of the American Dental Club of Paris; Mr. Paterson, president of the F. D. I.; Dr. Godon, director of the Dental School of Paris; Francis Jean, president of the F. D. N.; the foreign delegates; M. Thomas, president of the Odontological Association.

At half-past ten M. Quincerot, president of the committee, made his address. After having expressed his gratitude to the officials, his co-workers, to all the foreign and native *confrères* that were attending the ceremony, he reviewed the life of Horace Wells. Then M. Miniot, vice-president of the Municipal Council, representing the city of Paris, accepted the monument on behalf of the city. Under the sound of the American anthem played by a military band the covering fell from the beautiful work, by the sculptor Bertrand-Boutée, while the medallion of the great savant Paul Bert was seen on the right side of the base of the monument. Two floral tributes were laid at the foot of the statue by Dr. Subirana of Spain and Dr. Guerini of Italy. The memorable address of Dr. Jenkins, president of the American Dental Club, was greeted with the "Marseillaise."

There was a rush to hear the address of Professor Dastre. Suitably to the authority which his name implies he drew with a masterly hand an historical picture of surgical anesthesia, giving Horace

Wells the deserved credit of this discovery. This address, which betrayed deep historical and scientific research, was greeted with frantic applause. The address is printed below.

Other addresses were made by M. Miniot, vice-president of the Municipal Council, to thank the committee for the gift of the monument donated to the city of Paris; and by M. Berry, deputy. Then by Dr. Godon, director of the Dental School of Paris; by M. Francis Jean, representing the General Dental Association of France; by the foreign delegates, notably by Professor Jessen, who in the name of the German dentists did homage to Horace Wells; by Dr. Subirana, who said, "We glorify a martyr of science, who gave to humanity a most wonderful discovery for its relief, but to whom in his lifetime was given in return nothing but injustice and mockery." Finally, by M. Thomas, president of the French Odontological Association.

In closing this brief report, may I be permitted to compliment one of the men to whom the success of this beautiful celebration is due—namely, Dr. Geo. A. Roussel, treasurer, who hates publicity, but who will, I hope, excuse my indiscretion in this matter.

BARRIÉ, *Sec'y*
Horace Wells Monument Committee.

ADDRESS OF M. QUINCEROT.

M. Quincerot, president of the Horace Wells Monument Committee, spoke as follows:

On behalf of the Committee of Organization of the Horace Wells monument I have the honor of welcoming all those present. I would express our great gratitude to the representatives of the government, who have so generously given us their support, especially to the president of the Council of Ministers, and to the Ministry for Foreign Affairs, who, in spite of a recent decision of the Council forbidding any of them to take part or to be represented at any ceremony during this period of elections, have broken that rule and have honored us with a great favor by the presence of their distinguished delegates—and all this by reason of the truly scientific and humanitarian character of our ceremony. I would also thank the Academy of Science for its representation by one of its most eminent members, Professor Dastre, whose renown is universal throughout the scientific world. His presence among us cannot but give additional glory to this apotheosis, which will mark another epoch in the development of progress and civilization. We also owe a heartfelt debt of gratitude to the ambassador of the United States, who is officially among us. May this manifestation which he is attending and which he will certainly report to his government, render the ties of friendship which unite America and France still closer. Our gratitude is also due to the members of the Committee of Patrons for the moral support which they have given our work through their social or scientific influence. The entire success of this ceremony is due to the subscribers, for without their generosity our good-will would have been wasted.

To Mme. Paul Bert, who has kindly authorized us to use the name of her illustrious late husband together with that of Horace Wells, we express our most profound thanks. It remains for me to express my personal unrestricted gratitude to all my co-workers: to my enthusiastic *confrère,* Schwartz of Nîmes, who gave me the most ardent support in this idea of commemoration which I had conceived; to M. Paul Vasseur, editor of the *Monde Dentaire,* who by lending me the aid of its columns has helped in the realization of our idea; to all the members of the Committee of Organization, the delegates of societies, the directors of dental schools, the presidents of professional associations or fraternal societies, senators, deputies, the prefect of the Seine, the municipal councilors, the members of the press, and especially to Messrs. Huart, Dausset, George Berry, and Etienne, for their valuable assistance. If their modesty will permit, I owe another tribute to other devoted co-workers—to Dr. G. A. Roussel, our distinguished treasurer, who has accomplished his difficult task in par-

ticularly brilliant fashion owing to the extent of his professional friendly associations; who of his own accord two years ago went to the congress of Wiesbaden in order to proselytize for our work and to engage for our cause so much support, not to forget the time and influence which he has devoted to our service; and further, to our distinguished vice-presidents, Messrs. Levett and Barrié (the latter having been actual general secretary), who by their conscientious attendance to the numerous sessions of the committee have contributed a large share to our success; to my active and indefatigable *confrère,* Léger-Dorez, general secretary of the undertaking, who by his upright character and the loyal conviction which he manifested since the first suggestion of the noble purpose for which we wrought, has done a great deal toward its realization—this beautiful manifestation. He is a skeptic, but a friend of truth. To Dr. Jenkins, president of the American Dental Club of Paris; to Dr. Godon, director of the Dental School of Paris; to M. Francis Jean, president of the General Dental Association of France; to M. Thomas, president of the Odontological Association; to Dr. Subirana, president of the Spanish Odontological Society, and to Dr. Siffre—in short, to all, we give our thanks!

I have intentionally withheld till now the name of M. Bertrand-Boutée, the sculptor of the monument and a distinguished artist of strong and realistic talent, who with the aid of a simple engraving has reproduced in such happy fashion the traits of the man whom we are glorifying. The face of Wells here portrayed has notably an expression of genuine vitality which lifts this work of art above the mediocrity which generally attaches to ancestral figures whose memory is to be perpetuated. We congratulate our beloved sculptor, who has earned our heartfelt approbation. May these words of praise assure him of his great talent, and inspire him for new masterworks!

Allow me to finish here the agreeable task of giving thanks to all our devoted assistants. Those whom I may have forgotten will excuse me.

After reviewing in a few words the life and work of Horace Wells and Paul Bert, the speaker concluded: This, gentlemen, is a short biographical account of these two ingenious benefactors, both of whom were taken away from their scientific researches altogether too soon. But, with these regrets, I must not complain, for in our midst are the descendants of one of these men, Paul Bert, whom I would respectfully salute. I am indeed happy to see them attend the apotheosis which is symbolized by this monument to surgical anesthesia, for which the gratitude of all humanity is due. Moreover, these men stand as examples for future generations—for Wells died for science, Paul Bert for his country. I salute you, pioneers of progress! —you belong to posterity!

On behalf of the committee, I have the honor to turn the monument of Horace Wells over to the city of Paris. In deference to the Academy of Science which has graciously accorded us its high patronage and which is represented here by one of its most eminent members, I have the honor to ask Professor Dastre to kindly preside.

ADDRESS OF PROFESSOR DASTRE.

I have the honor of speaking on behalf of the Academy of Science, which has delegated me as its representative at this ceremony, which is of great interest to physiological science, the medical profession, and the history of scientific discovery. The deadening, the complete as well as the temporary suppression of suffering—in one word, *Anesthesia*—was the discovery of the man whose memory we honor by unveiling this bust; his name is Horace Wells. He practiced the profession of dental surgery in a little town of Vermont, viz, Hartford. It is hardly necessary, after the addresses which you have heard, and the speech of M. Quincerot, to stress the importance of such an event, and to enumerate again its important consequences, by giving a *résumé* of this marvelous discovery.

Anesthesia has not only revolutionized the practice of dentistry, it has also transformed surgery, whose marvelous development it has facilitated. Its benefactions are such that its discovery must be hailed not only as a factor in medico-surgical progress, but also as a notable improvement of human conditions in general. From this point of view the year 1844, which is the birth-year of that discovery, is a brilliant date in the history of modern times, and its discoverer is a benefactor of humanity. Let us therefore pay him a just tribute of gratitude after his death,—because he did not enjoy such tribute during his life.

The life of Horace Wells is that of an unfortunate discoverer, the life of a man who is not recognized. He sees the originality of his work being contested, and he believes himself robbed by his rivals and his enemies. Painful is the story of his disappointments, of his struggles, and of his vindication—when we think that the life of this enthusiastic and unfortunate man, Wells, is on the other hand of deep concern to the history of science, especially to the history of scientific discovery. As a fact, in this discovery of anesthesia, that has been taken and perfected by others, the originality of the discoverer is easily overlooked. The actual novelty of the discovery is not easy to prove. The enemies of Wells have maintained that he had only seized upon a phantom, a false image of anesthesia, and not upon anesthesia itself; it has been said that his rôle did not consist strictly in the discovery of a new fact, which is the characteristic of discoveries in general—that he is rather of secondary importance considering the fact that before him were others who in the course of their ordinary practice had hit upon what they considered this trifling thing, and who had dropped it.

There is apparently some truth in that criticism. It is true that not all was new in the discovery of Wells. Wells in fact produced anesthesia by having the patient breathe nitrous oxid. Nitrous oxid had been known for a long time, and had been inhaled many times. Nearly seventy years before, in 1779, the famous Priestley had presented a preparation of it to the chemists; also, in 1799, Sir Humphry Davy had inhaled it, and had had other persons around him do so. These experiments had not remained unnoticed; on the contrary they had found a strong echo in the scientific world, and for thirty years were in general vogue. Davy after inhaling this gas had experienced a sensation of exuberant joy, and quite frequently the result was found to be a very joyful agitation, from which the name "exhilarating gas," "laughing gas," was given to nitrous oxid. By this agreeable means the patient succeeded in losing consciousness of himself and of the world around him. This loss of consciousness was a condition closely bordering on anesthesia, but Davy went a step farther. He wrote as follows: "Nitrous oxid seems to possess the property of abolishing pain. It might be utilized in surgery." But he did not utilize it himself. His genius carried him along other routes. His studies in this line were abandoned in spite of the promise indicated in the above declaration.

The matter was gradually forgotten, except that now and then, in courses on chemistry or in meetings of students, inhalations of nitrous oxid remained more or less customary. It was a meeting of this kind that Horace Wells had the good fortune to attend at Hartford, on December 10, 1844. That evening the essayist, G. Colton, gave the men and women of the town a sort of entertaining and amusing lecture on chemistry, which according to custom culminated in the repetition of the experiments of Davy with nitrous oxid. That evening *Anesthesia was born!*—born of the astonishment which was produced in the mind of Horace Wells as he saw one of his neighbors, Samuel Colley, extremely agitated by the inhalation, bumping and knocking against benches and chairs, and yet, though bleeding freely, declaring both at that moment and afterward that he felt no pain. Our hero was greatly impressed. For the first time he had before his eyes "the wounded who does

not suffer." Pain was suppressed! A flash went through the mind of Wells illumining his whole life. Nitrous oxid appeared to him as the agent of which he had dreamed—the ideal anesthetic! That truth which had presented itself indistinctly and vaguely to the mind of Sir Humphry Davy and his contemporaries presented itself to Wells with extreme intensity and luminous evidence. It is in the ardent conviction of the potentiality latent in what had happened, in the certainty of its realization in the course of experiments that his thoughts suggested to him, that the discovery of anesthesia by Wells consists.

It has been said that to "discover" sometimes means to bring into operation a thought already thought; to appropriate a truth by the energy of one's conviction; finally, and more than all, to realize something by the doggedness in one's pursuit of one of those phantoms of a true idea which the scholar or the dilettante have seen dimly at the periphery of possibility. Such was the case with Wells. The meaning of the idea latent in this power of inducing insensibility, almost uncertain to Humphry Davy—who had dropped it, as it were—appeared to Wells with astonishing clearness, and he immediately tried to realize this idea. As you know, he made the experiment upon himself by having a tooth extracted under the influence of Davy's gas. Having been successful, he became the indefatigable propagator of dental anesthesia by means of nitrous oxid. It meant great boldness to believe in painless operation at a time when the kings of surgery, Velpeau at their head, had just declared that the search for a utilizable anesthesia was utopian or a chimera. Horace Wells possessed that boldness; he believed in and fought for absolute and prolonged anesthesia, though he himself could not prolong it more than a few moments. He—as the first man to do so—deliberately puts himself on record against the fatality of pain. The agent with which he was operating, "laughing gas," was not the best. Nevertheless, after the ball had started rolling, other agents were bound to be brought forward; in fact, almost immediately other agents were discovered which were above reproach—ether and chloroform.

Two years had hardly passed since that memorable evening at Hartford, when Morton and Jackson made communications on the properties of ether. The first operation under ether was made by Morton on September 30, 1846. On March 8, 1847, Flourens made a communication before the Academy of Science of Paris on chloroform.

Then for Horace Wells the long Calvary of unfortunate inventors began—the painful life which was to terminate in the room where he opened his arteries. It was no longer a question of nitrous oxid; anesthesia then meant the administration of ether or of chloroform. Nitrous oxid did not produce real anesthesia, it did not allow the long anesthetization necessary in surgical operations without danger of asphyxiation. It was suitable only for short anesthetization as necessary for dentists. The American surgeons could really not use it in prolonged operations except by the difficult application of great skill, consisting in producing a series of short and intermittent anesthetizations interrupted by phases of sensibility.

The task that Horace Wells undertook consisted in improving the methods of application of nitrous oxid in order to prolong the insensitivity, and to make nitrous oxid a rival and a substitute for chloroform and ether, thus making it a true anesthetic. Wells in his efforts found that this task was beyond his power. It was, however, not beyond the resources of science.

In our days, Paul Bert, the famous physiologist who is so much admired in the learned world, has furnished a convincing demonstration of the true anesthetic value of nitrous oxid, and of its theoretical superiority over ether and chloroform; and for that reason, on the monument, produced by the chisel of an eminent artist, the medallion of Paul Bert seems to support the figure of Horace Wells. Paul Bert recognized that

the efforts of the unfortunate inventor were doomed to failure. Nitrous oxid cannot be respired, and the inhalation of the gas in pure state produces asphyxiation, which occurs in a few seconds; on the other hand, in order that its anesthetizing action be produced, it must be administered in the most concentrated form, that is, pure. If diluted with air it is a stimulant, and only dulls sensibility. In one word, pure nitrous oxid anesthetizes, but it also asphyxiates; if it is diluted, it no longer asphyxiates, but neither does it anesthetize. This dilemma, in which Horace Wells remained involved, Paul Bert beautifully solved. By the ingenious idea of compression he succeeded in compensating for the effect of dilution, and became able to produce a gaseous mixture which has the anesthetizing properties of pure nitrous oxid and at the same time contains the quantity of oxygen necessary for respiration. He thus secured a lasting anesthesia without asphyxiation by having the patient inhale a mixture of five volumes of nitrous oxid and one volume of oxygen administered under a pressure exceeding the normal atmospheric by fifteen centimeters. The results have been admirable. The practical difficulties, the use of an operative chamber under pressure, were the only impediments to the universal adoption of this procedure, and its general substitution for chloroform and ether. But from a theoretical point of view Paul Bert's method represents the justification of the dream of Horace Wells. Paul Bert has thus made of nitrous oxid the equal and happy rival of the two typical anesthetics.

It was therefore true anesthesia which Horace Wells discovered; the American savant is the discoverer of anesthesia. Before him prolonged insensibility was only a grand dream. Through him and with him it has become a reality.

Members of the International Dental Federation, you may therefore, with a good conscience, glorify your hero, whose glory is reflected in your learned, honorable, and useful body.

ADDRESS OF DR. N. S. JENKINS.

On behalf of all the branches of American medicine, and in the name of the American people, I have the honor to thank generous France for this new proof of its inviolable adherence to its grand traditions. France has been the true center of science and art, and from this center of the intellectual life of Europe this spirit has radiated, deeply influencing all movements toward the elevation and amelioration of humanity. It was the merit of Horace Wells to observe that certain agents put in contact with the pulmonary surfaces produce a much more sudden and much deeper effect than that produced in the organism by the application of other methods. From this remarkable discovery diverse modifications have originated for the production of general anesthesia which are now in vogue in the whole world, and which, according to the words of Oliver Wendell Holmes, permit the knife of the surgeon to cleave the waters of oblivion. It was the merit of the French medical profession to recognize the primary originality and the merit of this great discovery, and to comfort the last and very sad days of Wells by the expression of their admiration and their sympathy. It is the merit of noble and hospitable France to pay today a substantial tribute to the memory of this great benefactor of humanity, and to affirm once more the immortal truth that science and philanthropy are not the property of any single nation, but are the glory and the sacred inheritance of all humanity.

ADDRESS OF DR. GODON.

On behalf of the Dental School of Paris, I am happy to congratulate the committee upon the thought of erecting a monument to Horace Wells, and I would thank them for having permitted a representative of that school to join them in commemorating one of the great men of our profession, who at the same time is one of the greatest benefactors of humanity. It is unnecessary to re-

trace here what Horace Wells was and what he did. Voices of more authority than mine, among them that of Professor Dastre who has honored us by presiding over this ceremony on behalf of the Academy of Science, have justly celebrated his work and the services which he has rendered by finding a means of not only modifying, but of suppressing suffering. As Paul Bert said, in 1884: "It is altogether fair that surgical anesthesia, discovered by a dentist, should also belong to the dentists." It is due to them, and for that reason the law of November 30, 1892, permits it to the French dental surgeon, as most foreign legislatures are permitting it to their practitioners of dentistry. Owing to this important concession, which was due to our *confrères* partly by right of adoption, partly by right of nationality, the dentist is not only a technician and a prosthetist, but he is also an anesthetist.

Like all discoveries, that of surgical anesthesia has been perfected; from general anesthesia it has become local, and dentists, owing to their experience with all sorts of cases, have also greatly contributed to this perfection. The numerous local anesthetics by which therapeutics is being continually enlarged are daily employed in our offices, in our clinics, and in our dispensaries, to the great benefit of our patients and to the certainty of our operations; thus continuous practice enables us to test and control the character of these agents and to increase the list of them according to our needs.

It were needless to say that the Dental School of Paris is anxious to join in this legitimate homage given to a great scientific event, the discovery made by Horace Wells, and wishes to perpetuate its memory. For several years a decision of our council of administration has attached the name of Horace Wells to the clinic in anesthesia which is given in our dispensary, as a feeble and modest tribute of gratitude, admiration, and recognition of a great man who has been neglected altogether too long—for which reason the Dental School of Paris is happy to attend a more splendid expression, a more solemn public homage. For that reason once more, on behalf of the Dental School of Paris, I thank and congratulate you, members of the committee, especially our *confrère* M. Quincerot, to whom is due the initiative in the idea of erecting a monument to Horace Wells in our great capital, so popular among foreigners, so beloved and so much visited by them, in the presence of the representatives of public authority who have come to consecrate and officially celebrate a purely dental event—of which we all have reason to be proud. That such a monument should have its place among us was in every way indicated; its lack seemed a sort of disregard toward one of the greatest names of scientific history. This neglect is now atoned for;—honor forever to Horace Wells!

ADDRESS OF DR. FRANCIS JEAN.

After the eloquent and authoritative words which we have heard, all further speaking seems superfluous. Suffice it to say, therefore, that the French National Dental Federation in general, and the General Association of the Dentists of France in particular, of which I have the honor to be president and on behalf of which I am speaking, join with all our heart in doing homage to Horace Wells. By elevating this monument to his memory, an omission is being rectified. I therefore congratulate the committee for this initiative, and I thank them for having summoned the dental societies to this ceremony of glorification of a dental surgeon. I am happy that the committee in a certain measure have associated with this manifestation the name of the learned Paul Bert, by dedicating a medallion to him. They have in that way aimed to recall the great part played by him in the progress accomplished in anesthesia, and have wished especially to emphasize the fact that he was one of the first to encourage the French dentists to found dental schools and to claim for themselves as their property surgical anesthesia as discovered by Horace Wells, whom we are celebrating

today. The unveiling of this monument is a festival day for the dental profession, and I am happy to have been invited to attend and to take part as a representative of the professional association, on whose behalf I wish to express my heartfelt gratitude.

ADDRESS OF DR. A. THOMAS.

By perpetuating the memory of these two scholars as symbolized by this stone, the international dental profession and the medical profession, united before these two images, add a beautiful page to the golden book of humanitarianism. In this unanimous and official outburst of recognition the representatives of these professions give testimony of the great gratitude which they owe to these two men. Of the dental profession the young men especially, though proud of the scientific halo which surrounds their profession, do not forget that it is to their elders that they owe the solution of its complex problems. Horace Wells was one of these investigators—all honor to his name! It is the young practitioners of today to whom the mission falls to instruct the coming generation about the life and the work of the men whom we celebrate this morning. The Odontological Society of France, which in the dental profession represents this scientific youth, has thought it befitting to add to this commemoration the tribute of its youthful admiration and its everlasting gratitude toward the men who donated to humanity and to the medical world the rich treasure of anesthesia.

OPENING GENERAL SESSION, F. D. I., March 25, 1910.

Honorary President—The Minister of Public Instruction.
Acting President—Professor Dastre.

THE session was opened at 10.30 A.M., in the Richelieu amphitheater of the University of Paris, the Sorbonne. M. Francis Jean, president of the French National Dental Federation, delivered the following address:

Mr. President, gentlemen, and dear confrères,—I have the great honor and pleasant duty to welcome, in the name of the French Dental Federation, the Executive Committee of the International Dental Federation, which under the able presidency of Mr. Paterson of London has returned to this city, as one returns to one's homestead, in order both to recall the joy of the stages already traveled, and to gather new inspiration and new energy for the future. I welcome you, dear *confrères!*—most of you have been co-workers since our birthday in 1900, at that International Dental Congress of Paris which represents an historical day to our profession. That which was commenced here you have continued in some of the most important cities of different nations. Nothing has arrested you in this work, which has become a postulate—neither the sea nor the long distances which you had to cover, nor the sacrifice of hours that otherwise might have been devoted to leisure. Paris hails your return with joy, and the National Dental Federation, recognizing your deeds, thanks you for this visit. We have done everything possible to afford you here the same facilities for work and the same atmosphere of good-will which you have found elsewhere. We have the great satisfaction of being able to hold this opening session under the honorary presidency of the Minister of Public Instruction, bearing witness of the interest which the government and his department take in our work. Permit me to express to him here our most heartfelt thanks.

M. Liard, rector of the university, has put at your disposal this glorious Sorbonne, to which have come all the masters of thought and knowledge, and where, as in a laboratory, modern progress has germinated. We are happy in

thanking M. Liard for the splendid environment which he has thus provided for our work. Finally we salute and thank him who, with his customary good grace, has agreed to actively preside over this opening session—that undisputed master in physiology, Professor Dastre, who among us has been such as Cambridge has had in its famous professor, Sir Michael Foster, and the University of Stockholm in its learned anatomist, Lindstrom. Scientific prestige, old philosophical culture, and young scientific progress combined, the good-will of the civil powers—all this our minister, and Rector Liard, and our learned master, Professor Dastre, have put at our disposal. In these happy conditions are expressed an honorable reward and have our most heartfelt appreciation.

[To the acting president, Professor Dastre:] Allow me, Mr. President, to state briefly why your presence is so dear to us as well as so honoring. Twenty-six years ago, when our profession had as yet no official existence, the dentists of France assembled, after having then but recently been united, and made an effort to organize dental instruction. Then a man came to them, encouraging, advising, and guiding them; that eminent physiologist, famous scholar, legislator, and as he called himself, patient, had the name of Paul Bert, a name of equal honor to France and to humanity. And it is difficult, Mr. President, to pronounce the name of Paul Bert without immediately recalling also the name of Professor Dastre. Professing the same science in the same chair, you are continuing his work, perfecting it, generalizing it, propagating it. It therefore seems natural that after having more than a quarter of a century ago the patronage, the aid, and the encouragement of Paul Bert, the dentists should today have the patronage, the aid, and the encouragement of Professor Dastre. This help you began to lend us at the very beginning of dental instruction in France, at the time when as lecturer in the Normal School you collaborated with Pasteur and Roux. Since that time you have never ceased to contribute to the development of dental science, which is indebted to you for the instruction which it derived from your remarkable works on anesthetics and their application, from your studies on the vaso-motor nerves and the nervous system—and now again, in that you have lent your encouragement and your patronage today, with all the prestige inherent to your high position in the scientific world. Only those wonder at these assemblies who do not know of the rapid evolution, the radical transformation of our profession, and the great pains which it is taking at the present time in making its contribution to the edifice of social solidarity which makes our modern world.

The first dental societies were founded in France about 1879, with the purpose of organizing dental instruction, which did not even exist before. In 1884 Paul Bert, who was interested in this movement, did not hesitate to predict in an eloquent address a great future for this movement. Fully eight years after that beautiful plea the public authorities began to stir in the matter, and a regulation was put into force for the practice of dental surgery in France. Having started from nothing, after thirteen years of strife the dentists now occupy a place among the other liberal professions. Dental instruction is now uniform, and the law of 1892 regulating such instruction is but the stamp of approval placed by the state upon this educational program. The evolution is the same everywhere; everywhere the dentists are organizing and slowly elevating their profession to the level of the other liberal professions through their own effort. Everywhere their conscientious labor and their energy are arousing the public powers from their indifference.

While undergoing this transformation our profession obeyed the modern law of association and the attracting power of solidarity. On August 14, 1900, at the Third International Dental Congress at Paris, Dr. Godon, who in the past was as ardently devoted as he is in the present, made two motions which gave birth to the International Dental Federation. Thus for the last ten years the dentists

of the whole world have been engaging in a common work, and are still seeking to further the progress of dental science, to give better service each day to those who suffer, and contribute to the public health the profit of its labor. We have a right to be proud of this noble and beautiful aim. In the course of these ten years the F. D. I. has held its meetings in every part of the world—at Cambridge, at Stockholm, at St. Louis, at Madrid, at Hanover, at Geneva, at Amsterdam, at Brussels, at Berlin. Everywhere this work has been fertile, and its vitality has proved how necessary this organization is, and to what extent its leaders are worthy of this organization. Since 1900 it has been our leader in instruction, specifically indicating in every way with both prudence and competence the various items in our program of instruction, and gaining the recognition which was requisite from the public authorities.

This important question of instruction has attracted the attention of eminent men, who have given their encouragement and their advice to the Federation. Among these I would mention Sir Michael Foster, who opened the session of 1901, following the constitution of the Federation, and who in an eloquent address clearly showed us the road which we were to travel. Such encouragement and such advice is most valuable to us, and we have received it everywhere; but we may congratulate ourselves especially in having had the opinions of these men on the question of instruction—which in the interest of the autonomy of our profession is in all countries of the world a question of life or death. The opinions formulated on this subject by men so fully qualified as Paul Bert or Michael Foster especially indorse our contention that, in order to make a good dentist, the medical qualification is at once too much and too little. From the work of the International Federation and its fruitful discussions have originated in France the recent laws which have altered our dental instruction by prolonging the duration of the course and by giving more attention to the practical side.

To the question of instruction comes another highly important matter at the present time, namely, that of Hygiene. No longer do we consider the work of prevention of disease and suffering simply to be the individual effort of the patient against his malady. We have realized that a great many diseases are due to collective ill-doing against which individual strivings are insufficient. We have learned to understand that all diseases because of their reflex action have general deplorable effects. This conception of the evil socially of disease, combined with the sentiment of solidarity which characterizes our era, has given birth everywhere to organizations for defense, and the civil authorities have not failed to encourage these initiative efforts. Long since, in the special domain of dental hygiene, our schools have opened clinics which are being more and more frequented, and at the same time some of our *confrères* have taken personal initiative in other fields. Thus, as in the clinics of the hospitals, reparative dentistry is more and more substituted by preservative dentistry—for healing is good, preventing is better. For this reason our profession is directing its efforts toward the care of school children and of young men drafted for military service. For some years the International Dental Federation has taken an interest in this question and has noted the results that have already been obtained. Those who have taken cognizance of the admirable organization of school dental clinics in Germany, England, Belgium, have entered the same field. The necessity of these institutions appeared so evident at the Congress of Berlin in 1909, that the International Dental Federation established its Commission on School Hygiene and its Commission on Military Hygiene as one permanent single body, which is made up of our most competent *confrères,* and to which his Majesty the King of Sweden has recently lent his high patronage. It is not necessary for me to recall that in

France we have entered upon the road to the realization of this desideratum. Our Minister of Public Instruction has recently extended the service of inspection to embrace the institutions of secondary instruction, and has established dental treatment in the primary normal schools and the superior primary schools. The Minister of War, too, has given directions for dental service to be organized in the army. We shall continue to help the government with our exact data, in order that these services, when extended over all our schools and all our military centers, may enable us not only to relieve suffering, but also to prevent dental maladies which are so painful and sometimes so detrimental to the organism. Such is our profession today, transformed by the light of science and animated by the generous spirit of solidarity.

Two important events will mark this meeting, indorsing only what I have already said: First, the awarding for the first time of the Miller prize, and second, the unveiling of the monument of Horace Wells in one of our public squares. The international Miller prize, founded at the instigation of the International Dental Federation in order to perpetuate the memory of the man who by his science and his superior standing so highly honored our entire profession —particularly the International Dental Federation, whose president he was at the time of his death—will be awarded for the first time. Is it not a most proper duty for a scientific profession to encourage science by honoring one of its masters? The same spirit and the same sentiment have brought about the final erection of the monument to Horace Wells, who discovered dental and surgical anesthesia. One of us, he is one whom humanity should salute as one of its greatest benefactors.

Gentlemen, this meeting, short though it be, will thus by the glorification of Horace Wells and Miller constitute one of the luminous pages in the history of our profession. It will signify the union of all for the realization of our ideal; it will demonstrate that among us scientific enlightenment is naturally being transformed into social solidarity. We occupy our place among those who seek, to use the words of the lamented Miller, "to render the most service to the greatest number." Our dreams of thirty years ago are realities of the present day. Tomorrow will even be better—as a guarantee we have the fraternal union of this hour—and the generous and scientific spirit which animates our profession will lead it to new progress.

Professor Dastre expressed his thanks to M. Francis Jean for his address and his excellent epitome of the professional movement since 1892.

Mr. W. B. Paterson of London, in the name of the British Dental Association, and before delivering his address as president, thanked the French National Dental Federation for the arrangements made to receive the F. D. I. and for assuring the success of this reunion.

(To be continued.)

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK.

Anniversary Meeting, December 1909.

THE forty-first anniversary meeting of the First District Dental Society of the State of New York was held on Tuesday evening, December 14, 1909, at the Academy of Medicine, No. 17 West 43d st., New York city. The vice-president, Dr. B. C. Nash, occupied the chair, and called the meeting to order.

The Secretary read the minutes of the last meeting, which were approved.

The paper of the evening was read by ARTHUR D. BLACK, M.D., D.D.S., of Chicago, entitled "Systematic Indexing and Classification of Dental Literature and its Possible Results," with the exhibition of about 40,000 cards, indexing articles from 1839 to date.

Dr. BLACK. It was with some hesitancy, I must confess, that I persuaded myself to bring here so dry a subject as I have brought. I appreciated the fact that other subjects that I might have presented would probably have been more entertaining. The committee, in extending an invitation to me to come here, asked me to say something on the work of organization that has been done in Illinois and the West. I did not feel that that would be a proper subject to present to you, on account of the fact that most of you are already familiar with that work. I have therefore brought a paper on the classifying of dental literature, and in connection with that subject I wish to present also some of the results of organization in our state particularly.

[Dr. Black then read his paper, which is printed in full at page 629 of the present issue of the COSMOS.]

At the conclusion of the paper, Dr. Black requested some of the members to call for the writings of any man, or any article or group of articles on any subject that had been published in the *Dental News Letter* or the DENTAL COSMOS, and the cards for such articles were quickly found, thus demonstrating the value of the index.

Dr. OTTOLENGUI. You asked for a test of this index. I want to see whether I have failed to understand this method of classification. Can you get me the formulas for plating gold? Is that a subject?

[This question is answered fully in Dr. Black's closing remarks.]

Discussion.

Dr. NASH. I will now call upon Dr. W. L. Fickes of Pittsburg, chairman of the committee appointed by the Institute of Pedagogics for the organization of a Dental Index Bureau, to discuss this subject.

Dr. W. L. FICKES. The clear and concise manner of Dr. Black's presentation of the subject is only rivaled by the simplicity of the method which he has demonstrated. It should not be necessary to add anything to what he has said in order to convince those present that if the teachers, editors, writers, and students of dentistry were to have access to such an index, it would have more influence on the advancement of the profession than any movement since the historic date of 1839.

The men of dentistry who are famous in history are those who read its literature in a careful, studious, and critical manner. There is nothing more instructive and inspiring to the dentist than a well-selected course of reading in the dental journals. Many valuable articles

are to be found in these journals, but we are dazed when we attempt to select a course of reading on any given subject because of the great amount of worthless material compared with that which is really useful. These articles are practically lost to us, unless we adopt some plan whereby the best may be selected for our use. A friend, who has one of the largest dental libraries, said to me a few days ago that as his library of journals increases in size, it becomes less useful to him because of the difficulty he experiences in finding what he wants.

To quote from an editorial on the subject of the "Dental Index Bureau" in the August number of the DENTAL COSMOS: "It is constantly said, and with a fair degree of justification, that the dental profession is not a reading profession—that practitioners of dentistry are not, generally speaking, interested in the literature of their profession. To anyone who keeps in touch with current dental literature it must be evident that but few writers ever take the trouble to familiarize themselves with what has already been written on the subjects which they themselves write about." I believe that the desire to read will be greatly stimulated by the improvement in the articles written as a consequence of the use of this index, and that the writers will, without a doubt, look up the previous articles on the subjects about which they are to write, if the trouble of doing so is reduced to such a minimum.

A noted teacher, in a letter, said, "I know that I have often read articles which embodied ideas that I wished to remember, but they and their sources have been completely forgotten. There has come to be so much to remember that an artificial memory is now a necessity." An artificial memory, quick, precise, and reliable in its action, has been described to us this evening, and its usefulness to the individual, as well as to the profession as a whole, will be inestimable.

Dr. Black's paper read before the Institute of Dental Pedagogics was the initial essay on the classification of dental literature. There seemed to be a general desire on the part of those present for an index such as was described in his paper. Other indexes were mentioned in the discussion, but the consensus of opinion seemed to be that this was the one to be preferred to all others. As has been stated by Dr. Black, a committee was appointed to arrange for the establishment of a Dental Index Bureau, for the purpose of distributing to those interested a classified index on the plan mentioned. This committee will report at the meeting of the Institute of Dental Pedagogics to be held at Toronto this month, and I am pleased to say that there is every prospect that the movement will be successful. It is the intention to index not only the best of our current dental literature, but also as much as possible of that of the past, and to furnish the same to subscribers in printed form. During the present year the committee has been working to establish a subscription list large enough to warrant the success of the undertaking. Subscriptions have been received from many of the leading colleges, and from a number of societies and individuals. I am not here for the purpose of soliciting subscriptions to this Index Bureau, but I certainly hope that when the list of subscribers is published, New York will be well represented.

The plan proposed for the indexing of current literature is as follows: To select in the beginning from five to ten of the best journals, including possibly one or two foreign publications, the number of journals to depend on the number of subscribers to the Bureau. Each article in the journals selected will be indexed by an expert dental cataloger, and cards will be prepared and arranged similar to those exhibited by Dr. Black tonight. The information on these cards will then be printed, either on a card or loose-leaf ledger system, and supplied to subscribers in such form that the additions from year to year may be made in their proper places, and every item will always be instantly accessible. In reproducing the original index cards in printed form there will be the advantage

of printing several items on each card or sheet, which will make the index more convenient and less bulky than it would be if it were typewritten.

For the literature of the past, the plan may be somewhat modified to suit conditions. Dr. Black has offered to allow the Bureau to copy this index of the COSMOS, if we so desire. If this is done, it would probably be best to reproduce it in book form. This entire index could be reproduced in one volume.

You are probably all aware of the great work being done in the Illinois State Dental Society through their postgraduate study course. Dr. Black has spoken of this work, but his modesty would not permit him to state the fact that the postgraduate course was only made possible by the use of the index which he had started, and through his subsequent work, with the assistance of others equally interested. Judging by the letters we have received, postgraduate reading courses are to be started in many societies throughout the country. This is one of the many uses to which the index may be put. Another way in which it will be invaluable is its use by committees in the preparation of society programs. The college authorities evidently appreciate the value of the index, as most of them have either subscribed or have promised to do so. As Dr. Black has pointed out, the placing of an index in each of the leading colleges is going to have a very helpful influence in the teaching of dentistry; and because most of the prominent writers upon dental topics are college teachers, it will have a tendency to greatly improve the dental literature of the future.

On the part of our profession there seems to be a general awakening of interest in our literature, and we owe Dr. Black a mark of our appreciation for initiating a dental index at this opportune time. The essayist deserves the commendation of all who have had the pleasure of listening to him, and this society is to be congratulated on having secured a paper on a subject of such vital interest to the whole dental profession.

Dr. A. L. SWIFT. I can simply commend this stupendous work, and prophesy wonderful results for the future, as the essayist has suggested, in the increase of interest among the students and the profession generally in all our literature. I think that the work will be greatly appreciated by not only the teaching fraternity, but the editorial staff of all our magazines and journals. I believe the possibilities of this card system are unlimited, and I can only offer my hearty commendation of this great work.

Dr. R. OTTOLENGUI. Some of you know, and perhaps some may be surprised to hear, that I am the editor of a dental journal. One fixed idea that I have always had in the management of *Items of Interest* I received long ago from Dr. J. D. White. He told me many years ago that the chief aim he had in his conduct of the DENTAL COSMOS was that its early volumes should always be necessary to dental libraries—that the DENTAL COSMOS as a whole should be an encyclopedia of dentistry.

After the COSMOS had existed for twenty-four years, a topical index of the numbers was made and published in book form. Since that time the topical index has been continued from year to year. Dr. Black is in error when he says that the published index was made from the previous indices of the back numbers. This index to twenty-four volumes was originated by our beloved *confrère* Dr. A. L. Northrop for use in his own library. A real index did not exist in the COSMOS until after this book was published.

I have, with one or two exceptions, a complete file of the DENTAL COSMOS, and that topical index is the most important volume in the set. Since then, each annual volume has had its own topical index, but in consulting the COSMOS as I have frequently had occasion to do, on any particular subject, it was much simpler to consult any of the volumes back of the twenty-fourth than any of those since, because it is necessary to handle every volume since the twenty-fifth; whereas in that single published index of the previous twenty-four, one could easily be guided by the index of

all the articles dealing with the subject.

It has been my aim to conduct the magazine in which I am interested along such lines as would make the bound volumes reference books, and to make the topical index useful to students. Our index has not been as good as it should be, because we have lacked skilful cataloguers or index writers to do it for us; but there has been a system followed, both in the *Items of Interest* index and in the index of the DENTAL COSMOS, which does not seem to exist in the index that has been brought forth tonight, and that was the reason why I asked that question.

The value of this index is inestimable. If I could point out a flaw in it, especially after the announcement that a new index is to be brought forth, Dr. Black would probably be better pleased than if I should merely commend it.

This entire index seems to be founded upon the titles of the articles to which they allude, and the names of the writers. Very frequently, the title of an article is a poor indication of what the article contains. For example, we have announced for next Tuesday night a paper by Dr. E. Edmund Kells of New Orleans, entitled "In Black and White." Does anyone of you know what that paper is to be about? I do, but the rest of you will probably not know until you come here.

As an editor, I receive a great many letters of inquiry about back literature in our magazine and in other magazines. I receive many letters asking just such questions as I asked Dr. Black. Only recently a writer asked for a good formula for plating gold. We have had formulas for many years, but we do not find a ready reference to them in this index, good as it is.

At the risk of repeating myself, I wish to explain that the main purpose in what we call the box headings in *Items of Interest* has been to supplement the title of the author by adding an index to every important phase of his subject, or to its subdivisions. Our box headings are not for decorative purposes; they are intended to help the indexer, and the person looking for a subject. For example, in looking for a topic in the DENTAL COSMOS the index leads you to a certain page. You must read that entire page to find the allusion indicated. A man might be writing about fractures of the maxilla, and in conjunction he might speak of their effect on the mandibular artery. Under "mandibular artery" in the DENTAL COSMOS you might find "page 583." You would have to read the whole of that page. In *Items of Interest* I would have a box heading which would read "Effect on Mandibular Artery."

In regard to the following passage in Dr. Black's paper: "It should be recognized that our literature cannot advance more rapidly than the men who write it. The editor of a dental journal cannot publish an ideal dental journal unless the contributions come from ideal writers. Certainly none would welcome with more joy such an index than the editors of dental journals." I wanted to say aloud, "Hurrah! hurrah!"

When a considerable number of states are as well organized as Illinois is now—a condition which is rapidly approaching reality—and when the state organizations are united under a national direction, impossibilities in the past will become natural and easy certainties of the future.

It is because I have recognized and appreciated this wonderful organization in the state of Illinois, and because I have recognized the work which Dr. Black has been doing in going from state to state, that I went to Boston and prognosticated before the National Dental Association that if the National Dental Association be not reorganized, another organization will come. Some think that I was doing this to stir up trouble. I do not wish to see two national associations, but one—and we have none! —and that is largely due to the men in our own New York State Dental Society. Exactly the same condition obtains in the National Association as obtains here. I am not impugning motives, but the plan. There is a claim that we do not want large societies, that we do not need them. We do want large societies, and we do need them, and the

New York State Dental Society is already away behind in the race, because it is one of the few which has not invited Arthur Black to come to Albany and tell us how to reorganize our society.

You have heard what this man is doing. I am not a member of this society, and cannot offer a resolution; but the president of this society is the president of the State Society, and I would be glad if someone would propose the following resolution, to be adopted tonight:

RESOLVED, That it is the advice of the First District Dental Society that our State Society be reorganized in accordance with the plan of the Illinois State Dental Society.

Dr. W. W. WALKER. I move that we adopt that resolution.

The motion was carried.

Dr. S. G. PERRY. Dr. Black says he was afraid that we would consider this a dry subject; but that is not the case. On the contrary, this is a subject of the greatest interest for students and scholars in the dental profession, and pre-eminently a subject for practical workers, as Dr. Ottolengui has outlined. It must be a very great convenience for any busy practitioner to be able to turn quickly to what has been said and what has been written on a subject that perplexes him. I wonder if the members of this society appreciate what it is to receive such an aid as this. I wonder if every individual in this room realizes under what obligations he is to Dr. Black for such a precious document.

This society should take immediate action to pass an overwhelming vote of thanks, not only for the voluminous paper and the work which Dr. Black has done, but particularly for the gift of a document like this. It was seen by chance on my desk today by one of the most eminent surgeons in this city. He looked it over and said "That is one of the most valuable things I ever saw. That is invaluable for a man interested in the literature of his profession."

I beg of you to look it over from beginning to end. It will make scholars of you. I have had the good fortune to have the DENTAL COSMOS from the beginning of its publication, and when I lost one copy I felt very badly about it, but through the great kindness of Dr. Kirk it was sent to me. I prize that encyclopedia—for Dr. Ottolengui has well named it so—more highly than any other books that I have in my possession, and I have some books that I consider very choice.

I hope you will fully appreciate this index, and will not miss filing away a copy of it.

Dr. Black is a worthy son of a worthy sire—working, as you see, on the same lines as his honored father, and he will look back with great pride on the work he has started. It will help the indiscriminate masses in the profession, but to the real workers this document, in my judgment, is invaluable.

Dr. M. L. RHEIN. There has been so much commendation of this subject, so ably presented this evening, that it seems almost superfluous to add anything in that direction.

There is little question but that an index properly prepared along these lines for dental literature is an absolute necessity. This deficiency is unknown in medical literature, and the great amount of space which the indices cover annually in medical literature in this country are the most potent argument for the necessity of such an index in our own field.

The work of Dr. Black can hardly be improved upon. I realize that when I was called upon to discuss this paper, the idea was to inject, if possible, some spirit of opposition. In carefully reading Dr. Black's magnificent effort, I tried very hard to discover some deficiency, and I did finally find something with which I thoroughly disagreed.

There are in my opinion two classes of students; the essayist in his use of the term has combined the qualities and proclivities of the student in the dental college, and I differ with him in this respect. While I believe that we need an index of this kind, I do not consider the essayist's argument as to its value in dental education to be a good one, for the difficulty in dental education at the present time is precisely this eclectic form of instruction which the essayist

thinks would be of benefit for the student in the dental college.

I think this is exactly what the dental student suffers from. Many years ago, I had the same view on this subject as the essayist, but a careful watching of the courses of dental instruction throughout the entire world, and especially of the finished product as it emanates, has caused me to change my views.

It appears to me that if the students were taught one method of procedure only in the different branches of work, they would be graduated with more confidence and ability to do such work, even if they did not adhere to these methods later on.

It is just for this reason that if I had any influence in any dental educational institution, I should strongly advise that the student body be restricted in their intellectual labors to the work of the faculty, and leave the development of what ought to be the real study period of their lives until after they have received their diplomas as graduate dentists.

It was difficult to find some point of objection, but I finally found that I disagree with Dr. Black in this particular point.

Dr. Black. I am delighted that Dr. Ottolengui brought up the other phase of the plan for the index, because it shows that I did not explain that well enough. This index does exactly what Dr. Ottolengui wants; we pay no attention either to the title of the article nor its wording. We index the contents of the article. Take the article to be read here next week, by Dr. Kells, entitled "Black and White." That in the average index would be placed under the letter "B" as "black and white," but in this index the contents of the paper would determine its being listed under the subject of which it treats. It is an unfortunate feature of this work that the cataloger must spend most of his time in determining where to place the least valuable writings. Such papers must often be read through several times to determine their proper place in the classification. A good writer selects a title that indicates plainly what his article treats about, and a glance over the paper is sufficient.

In reply to Dr. Ottolengui's question regarding articles on gold plating, I call your attention to the fact that this dental classification is really only one small part of the Dewey classification, and that articles on gold plating would be more properly placed under the heading of gold in chemistry (546.91), or under plated ware in manufactured articles (671), yet we might also have articles on gold plating in the dental classification under dental chemistry (D38) or possibly under gold fillings (D221), or gold dentures (D322), or gold crowns (D331), or under orthodontia (D4). Under the heading "gold" in the index, all of these would be shown.

Dr. Ottolengui. Yes, but this is not direct. There are certain subjects in dentistry that I keep in my mind, because men are constantly asking about them. If someone wishes to find a formula for plating gold, he must look in three places.

Dr. Black. This index may be carried out under as many subjects as you want. I have not carried it out as far as it could be, but there is no reason why it could not be enlarged, by adding more figures. This would be easier than Dr. Ottolengui's plan, because you could put a separate heading for gold plating under dental chemistry and classify all such articles or references there. They would then all be indexed in one place. This may be done with any single item or division of any subject.

The *Journal of the American Medical Association* has attempted to compile an index on the plan mentioned by Dr. Ottolengui. I have been informed that the worst problem they encounter is the publication of the index of their journal. They spend thousands of dollars on it every year, and yet it is far from being satisfactory.

I want to make a suggestion as to a possibility of the future, particularly in view of Dr. Ottolengui's remarks. Suppose we carry this system out a little farther in detail, which can easily be done. Suppose such a system were adopted by the Institute of Pedagogics and by a number of our dental journals. It would be the simplest matter in the

world for our editors to go through the articles, and along the margin put index numbers for every article, or for paragraphs of articles, if desired, and print them in the journal at the same time that the journal is printed. At the end of the year every item could be found, and there would be no trouble at all. The index for the year would be made up by arranging all of these numbers, with their corresponding titles, in their proper order. They would thus constitute a properly classified index for the volume.

Dr. Ottolengui. I should be glad, if you will send me the list, to index our magazine in that way.

Dr. Black. In regard to what Dr. Rhein said, it took me a little while to get in my mind the argument of his opposition, and it is possible that Dr. Rhein may have misunderstood me. I did not mean that the schools should teach a lot of methods, but I think if each professor picked out a few of the articles written by men prominent in his subject, even though they did not quite agree with him, and enabled the students to obtain an idea of other men's thoughts, they would be benefited. In one of our schools the men are taught to do a certain thing in a certain way; in another they are told to do the same thing in another way. As a result there is a lively argument every time the graduates of those two schools meet and such a subject is discussed. If those men were told before they graduate that other men do not have the same views, and why, they would be in a better position to discuss the particular subject.

Since Dr. Ottolengui has made some remarks which might lead you to think that some of us Westerners are hanging up a flag, I want to answer him in regard to the National Association. Counting the states which are now reorganizing, we shall within another year have probably close to 8000 members in those state societies that have reorganized. I believe that if the National Dental Association does not do something soon, nobody can keep another organization from being formed; but in defense of the policy of the Illinois State Dental Society I wish to say that while I believe that the Illinois State Society could at any time effect the organization of a new national association, we have held everybody back from doing so. We do not wish two national associations, but try to preserve harmony.

We do not wish to oppose the National Dental Association. We have taken this stand in the face of the fact that our society sent a resolution to them at Minneapolis, asking them to take up the work of organizing other states, and although our committee went to the secretary on three different occasions during the Minneapolis meeting, the presentation of our resolutions was not allowed.

The Illinois State Society has fought against the formation of another national association. But we do want to see a good National Dental Association, and whenever a plan is proposed that is right, we are ready to support it.

Dr. Walker moved that a very hearty vote of thanks be extended to Dr. Black, not only for the splendid way in which he presented his paper, but also for the magnificent gift to the society as represented in the book which he compiled of the society's proceedings since 1868.

The motion was unanimously carried.

Dr. Nash. As to the resolution on reorganization which was presented by Dr. Walker, as it is rather an unusual way in which to bring up a matter of this kind, I would say that personally I have no feeling regarding it, but I regard the motion as merely a recommendation to the State Society, which it will probably take care of in due time.

Dr. Rhein. I move that it is the sense of the First District Dental Society that the Executive Committee be given the power to become subscribers to this index, so that the First District Dental Society shall have in its possession as full an index as it is possible to obtain, according to the plan outlined. I offer this as a motion, so there will be no question of the Executive Committee having the power to act.

The motion was carried.

Adjournment.

Herbert L. Wheeler, *Sec'y.*

THE DENTAL COSMOS

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Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

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PHILADELPHIA, JUNE 1910.

EDITORIAL DEPARTMENT.

THE DENTAL HYGIENE MOVEMENT.

REDUCED to its simplest terms, the present stage of the general movement having for its object the improvement of dental and oral conditions in public school children may be regarded or defined as a crusade against dental caries and the conditions which are productive of dental caries. Statistics gathered in all countries furnish proof of the alarming fact that about 95 per cent. of civilized humanity are afflicted with dental caries, entailing more or less damage to health in a variety of ways.

Because of the universal character of the disorder and because of the disastrous consequences which are known to be directly and indirectly caused by it, the importance of energetic and intelligently organized effort directed toward the amelioration of this widespread evil has tended to obscure certain other and equally important aspects of the problem of public oral hygiene. It cannot be doubted that work efficiently directed and carried out with

respect to repairing the ravages of tooth-decay and the placing of school children's mouths in proper hygienic condition will do a splendid work in the betterment of their health conditions; nor can it be doubted that the accomplishment of this work will be a service which will redound to the credit of dentistry and tend to more securely place its ministrations among the benefactions of mankind—both of which are laudable objects of the highest importance. The field of dental service is, however, much greater than that which is circumscribed within the limits defined by the treatment of dental caries and its sequelæ. Studies which have for some time been under way in various localities with respect to the causes of mental backwardness in school children have already brought to light a large number of cases in which the intellectual faculties, the mental efficiency, of the school child have been seriously impaired by reflex irritation from preventable dental lesions other than tooth-caries.

The school age is one of the critical stages of human development. It covers the most important period of dentitional evolution and is a time when the nervous organization is subject to a variety of stresses and irritations which may and often do produce effects of the most serious character. The physiological activities going on in both jaws in connection with the exchange of the deciduous for the permanent dentures are in themselves sources of nervous stress, and when interferences occur which delay or obstruct the process, an amount of peripheral irritation is set up which is the fruitful cause of many and often serious reflex disturbances. Chorea, epilepsy, dementia præcox, mental backwardness, often have their unsuspected origin in impactions, infections, and malpositions of the teeth at the period under consideration. It is just this class of cases that require most attention, not only on account of the graver pathological conditions which they present, but because of the mental backwardness which they involve and which makes those thus affected not only more or less helpless as individuals, but an added care and financial burden to the state—a burden which statisticians have shown involves a greater cost than it would to repair the defects by proper dental service.

Properly organized dental service must seek out these cases and correct them, and to accomplish this requires skilled and

specially trained experts as school inspectors. While in the beginning the more obvious cases of dental disorder will be those most promptly recognized and treated, provision for the diagnosis and care of the more obscure cases of neurosis having dental origin should be made, if the full usefulness of dental service among public school children is to be realized and dentistry is to attain its true position among the public benefactions.

OUR FRONTISPIECE.

In our frontispiece we are enabled to show to all our readers the excellent production of the French artist Bertrand-Boutée, the monument erected in Paris as a generous tribute from our Gallic *confrères* to the memory of Horace Wells. Those who had the good fortune to be present at its unveiling, March 27th, in the Place des États-Unis, will not soon forget that happy occasion, nor the admirable addresses delivered, wherein the discoverer of anesthesia was frankly accorded the high place to which his intellectual insight and foresight and his tenacity of purpose in pursuit of his ideal entitle him, but which he unhappily, like many another benefactor of mankind, failed to receive from his own generation. These addresses will be found in the pages of our present issue.

The inauguration of the monument was most auspiciously timed, occurring on the occasion of the return to Paris, after its circuit of the past ten years, of the F. D. I., the embodiment of cosmopolitan fraternity. The whole proceedings at Paris, including the hearty recognition by the public authorities, were truly gratifying, while the monument to Wells and the award to Black show that dentistry, now so busily engaged in the solution of the great problems involved in the prosecution of its beneficent work, does not fail to give honor to those who have aided and honored it and who have wrought nobly in our common work for the good of humanity.

Correction. In Dr. H. R. Raper's paper on "Formocresol," published in our issue for May, read (page 559, second line of second column), for "aseptic matter," "*septic* matter."

BIBLIOGRAPHICAL.

ATLAS DER ZAHNHEILKUNDE IN STEREOSKOPISCHEN BILDERN. [ATLAS OF DENTAL SCIENCE IN STEREOSCOPIC VIEWS.] Edited by KARL WITZEL. First issue—Anatomy: Fifty-two plates, with German, English, and French text. Julius Springer, Berlin, 1909. Price *M.*24.

The name of W. D. Miller has been honored by the dedication to his memory of another monumental work of widest scope, which is to comprise the anatomy, histology, pathology, surgery, dermatology, bacteriology, orthodontia, technical and preservative treatment of the mouth and teeth. In the present first issue the author subjects the different types of jaws and their internal structure to a comparative study—which is most pertinent to oral surgery and orthodontia, for only by close comparative study are we able to arrive at guiding principles based on the topographical situation of the teeth in the jaws. Just as the surgeon can only be successful if he possesses a perfect knowledge of anatomy and pathology, so the dentist can only be a successful operator if he has learned to think surgically, as it were. Following these principles, the author illustrates the development of the human skull from birth through the stages between the sixth and eighth, twelfth and sixteenth, eighteenth and twentieth, twenty-first and twenty-fourth month, and so on to the twenty-first year, finally presenting the skull of an individual of about eighty years of age, exhibiting the phenomena of complete senile degeneration. In many of these plates the frontal alveolar walls have been dissected away, exposing the situations and crowded conditions of the teeth before the eruption of the permanent set, and the arrangement of normal temporary sets at various stages of adult life. The value of these plates for preservative dentistry, and especially orthodontia, need not be emphasized. In the last two plates the ramifications of the bloodvessels and of the nerves are demonstrated in most remarkably clear preparations, which are of the utmost value in the study of the technique of hemostasia and local anesthesia. The plates are prepared from beautiful photographs after the new bromo-silver rotary process of the New Photographic Society of Berlin-Steglitz, of very convenient size, which show up most plastically and life-like in the stereoscope. For these reasons this atlas is especially valuable for demonstrating purposes in all schools that are not liberally supplied with dissections, preparations, and illustrated works, but every student and practitioner also can obtain no better object lesson than is offered by a close study of these views. The plates are further elucidated by an attractive volume of explanatory text of 108 pages, written in German, English, and French, the English portion of which might be improved in smoothness. The forthcoming series of this atlas may be awaited with interest.

Old and New Dental Journals.

The twenty-fifth anniversary jubilee of the oldest Russian dental journal, the *Subowratschebny Westnik,* was celebrated at St. Petersburg on January 23, 1910, by a meeting of a number of representatives of learned institutions, dental journals, and dental and medical societies. This journal was founded in 1885 by A. P. Sinitzyn, with an issue of 250 and a subscription list of 125. Today the subscriptions have reached the 3000 mark, and the issue has grown to 6000 copies. The journal, which is a monthly, is edited by Zahnarzt Spiegelglas, with the assistance of Dr. Swershchowski and Zahnarzt Buzewitsch.

A number of new dental journals have appeared whose editors we wish a hearty God-speed on the laborious road to success.

The rapid and propitious progress of dentistry in the Far East is evinced by the new Japanese *Shikwa Shimpo* (*Dental Record*), published in Tokio, which, though of recent origin, enjoys a wide circulation in Japan, Korea, and China. The *Shikwa Shimpo* is the official organ of the alumni of the Dental College of Tokio, connected with one of the principal medical schools in Japan.

To the remarkable progress of dental science in South America two new journals in the Spanish language bear witness: *La Odontología Argentina* and *La Odontología Colombiana.*

La Odontología Argentina is a monthly, which is published in Buenos Aires under the directorship of Juan B. Patrone, and its list of regular contributors insures the superior quality of the matter offered. Among this list we note Luís Subirana of Spain, E. C. Carpenter, C. Milanez dos Santos, A. Benicio de Sá, R. Chapot-Prévost, P. M. Paula Ramos, Benjamín Gonzaga of Brazil, and Antonio Sierra, J. S. Burnett, Hector Cohas, Alejandro Lamas of Uruguay, the list of Argentine contributors not yet having been completed.

La Odontología Colombiana is published in Bogotá, Colombia, under the directorship of Rafael Tamayo, its editor-in-chief being Alberto Patiño, who is assisted by Sebastián Carrasquilla, Joaquín Restrepo Tamayo, and Rafael Gómez G. This journal is a monthly devoted to the progress of dental science, art, and literature. In the first issue, January 1910, we note especially the announcement of the First Dental Congress of Colombia, to be opened on July 20, 1910.

In Italy also a young scion of dental literature has sprung up, the *Rivista Trimestrale di Odontojatria e Protesi Dentaria,* edited in Milan by Prof. Dr. G. Fasoli. Among the original contributions in the first (January 1910) issue we note especially one by Dr. Luigi Arnone on "Softening and Hyperesthesia of Dentin," and two articles by the editor, on "Some New Silicate Cements" and "Amalgam Inlays and Their Inconveniences." The list of contents further includes translations of foreign articles, "Review of Current Dental Literature," "Useful Practical Hints," "Notes," and "Necrology," which proves that the arrangement introduced some years ago by the Dental Cosmos has become standard all the world over.

R. H. R.

Review of Current Dental Literature.

[*Revue Trimestrielle Belge de Stomatologie*, Antwerp, December 1909.]

VINCENT'S ANGINA. By Dr. E. Jauquet, Brussels.

Vincent's angina, though generally localized in the tonsils, sometimes invades the mouth. It was first described by Vincent in 1898 as a particular form of diphtheroid angina, or ulcero-membranous angina, presenting two distinct stages, the first a pseudo-diphtheric one, characterized especially by the presence of a false membrane on the tonsils, the second characterized by a more or less deep ulceration. The prodromes are generally little accentuated, and resemble those of ordinary angina. Soon the affection becomes localized at one tonsil, rarely both, still more rarely at the pillars, the soft palate, the uvula, and other regions of the mouth. A whitish plaque of diphtheroid appearance is noted, which can only be distinguished from true diphtherial plaque upon bacteriological examination. The breath of the patient is extremely fetid, and the first lesion in a few days gives way to a spreading ulceration. It is covered with a grayish coat that is easily detached and of irregular shape, and bleeds at the slightest touch. After a period varying for from eight to fifteen days, the affection recedes and disappears, leaving no traces unless the lesions have been very deep. In poor health the affection may be more severe and give rise to various complications. It is contagious, but can establish itself only in a weakened territory. Vincent's angina is caused by a proliferation of two typical microbes that are easily demonstrated. The more characteristic of the two is a bacillus of considerable dimensions (from five to ten microns), generally rectilinear, ending in a point at both extremities, resembling a spindle. The body of this bacillus presents alternately light and dark regions. The second bacillus, which is constantly found together with the fusiform bacillus, is a long and very thin spirillum, and is far more difficult to demonstrate than its companion. Both take several stains readily, especially toluidin, but not Gram, which in exceptionally doubtful cases may serve in differentiating them from Loeffler's bacillus.

Vincent's bacilli and the spirilla abound under normal conditions in the oral cavity, especially in recesses and carious spots, and it is from these that they invade the neighboring regions, if from some cause the vitality and power of resistance is lowered. Differential diagnosis between Vincent's angina and diphtheria is most important, yet not very difficult by means of bacteriological examination. In the ulcerous period it may be mistaken for syphilis, and a careful bacteriological examination is therefore imperative. In the overwhelming majority of cases the affection is benign, yet precautions should be taken to avoid serious lesions, and to shorten the duration of the affection. The most efficacious treatment seems to consist in carrying a small quantity of pure methylene blue in powder to the affected region on a pellet of cotton. Besides, frequent gargling with diluted neutral oxygenated water is recommended. If it be necessary, the general health of the patient should be improved. Generally the affection disappears after two or three days of treatment.

[*Ash's Wiener Vierteljahrs-Fachblatt*, Vienna, February 1910.]

LEPKOWSKI'S NEW ROOT-CANAL TREATMENT WITH SODIUM SUBCHLORID AND CAUSTIC SODA. By Dr. F. Jossé, Cracow.

Not satisfied with the action of tricresolformalin, which evaporates quickly, has only a superficial effect, and consequently does not destroy the micro-organisms in the canaliculi, also produces severe pain if brought in contact with the soft tissue, Lepkowski uses for the sterilization of root-canals sodium subchlorid with addition of a little caustic soda, which mixture he calls "radicin." This mixture dissolves organic substances after a

time, and destroys the micro-organisms. The fetid odor disappears, and since no coagulation of the albuminous substances occurs, its effect is very penetrating. The tooth is not discolored, rather bleached. The application is the same as that of tricresol-formalin. In complicated cases, inflammation at the apex, abscess, fistula, etc., the effect is certain and rapid, suppuration ceasing after two days, and the inflammation disappearing. The mixture does not evaporate nor decompose if preserved for any length of time, does not produce pain or burns, and stops hemorrhage in the root-canals. The effect of this mixture on root-fillings in the test tube is as follows: Fletcher's artificial dentin loses its consistence after a few hours, leaving a residue; zinc and silicate cements lose their consistence after several days, copper amalgam remains unchanged, and gold forms a residue at the bottom and the walls of the test tube. This has to be taken into consideration in filling by interposing a layer of cement between the tooth and the filling proper. The results in five hundred cases extending over a period of eight months have been very satisfactory. In some cases of pyorrhea alveolaris with loose teeth considerable improvement was noted after root-canal treatment, the teeth becoming firmer and the inflammation disappearing. This provisional report may induce some practitioners to experiment with this new root-canal treatment.

[*Le Journal Dentaire Belge*, Brussels, January–March 1910.]

CURETTAGE OF THE ALVEOLUS AND THE ROOT IN CHRONIC ALVEOLAR ABSCESS. By Professor M. Roy, Paris.

In chronic alveolar abscess the alveolar lesions are much more extensive than those of the root. In the root, the lesions are generally not limited to the apical region, of which often only a small portion is involved, and the lesions extend over a more or less considerable portion of one or several lateral surfaces, which are consequently denuded of ligament. The suppuration in chronic alveolar abscess is not due, as some authors claim, to the denudation of the apex of its ligament, the apex in their opinion playing the part of a foreign body of which the organism is trying to rid itself. On the contrary, the preservation of an important part of the root, though denuded of ligament, does not prevent the disappearance of the suppuration and the closure of the fistulous tracts, provided the infection which is the primary cause of the abscess disappears, and the abscess field has been thoroughly cleansed. Resection of the apex generally does not remove all diseased portions, and often involves sound portions of the root. According to the extent and the location of the lesions, each factor is to be treated separately by the most direct way, *i.e.* the infection of the pulp through the root-canals, the alveolar abscess by way of the alveolus. If an alveolar abscess resists treatment by way of disinfection of the tooth, cauterization of the abscessed pocket or the fistulous tract, curettage of the alveolus and the root is the operation of preference. This operation is also indicated in the treatment of root-cysts. Curettage of the alveolus and root consists in a complete cleansing of the abscess field by way of the alveolus, and comprises the following steps: A vertical incision is made with a bistoury, or, still better, a thermo-cautery, into the mucosa at the level of the apical extremity of the root, or at some other level in case of a blind canal. The alveolar septum if present is opened, though generally it is found to be destroyed. Even then the aperture may be conveniently widened if necessary in order to freely expose the abscess region. With a moderately sharp round bur the alveolar walls and the diseased portions of the root are curetted, carefully guarding the sound portions and without resecting the root. After curetting, the wound is cleansed with a 1:10 solution of zinc chlorid and left to itself without tamponade, and the root-canal is disinfected and filled during the following week. Healing takes place in from four to six weeks. This operation is applicable equally in multi-rooted as in single-rooted teeth. Without removing an excessive amount of tissue the field for this operation must be fully opened, and good hemostasis must be established in order to restrict the curettage to diseased portions only, and to safeguard the sound portions of the root and the alveolus. In the author's hands this operation has always yielded excellent results in every class of teeth, upper and lower. The presence of sometimes very extensive areas of denudation of

root-ligament has never interfered with the immediate disappearance of the suppuration after this operation, nor prevented the perfect cicatrization of the abscess cavities. Roy's claims are fully borne out by an extensive clinical material.

[*L'Odontologie*, Paris, February 28, 1910.]

SECONDARY CARIES FROM LACTIC FERMENT MEDICATION. By P. Vanel, Paris.

For several years diverse preparations based on lactic ferments have been in use, such as milk in different forms, bouillon, powder, tablets. The author has noted in connection with such medication several cases of multiple, very rapid caries, especially at the approximal surfaces, and therefore sounds a timely note of warning. The important rôle that lactic acid plays in dental caries has long been recognized, and lactic acid preparations are apt not only to increase the destructive effects of this acid locally, but also by way of the general circulation. The oral cavity and the saliva offer a most favorable medium for the bacterial flora of lactic acid preparations, such as kefir, kumyss, sour milk, leben, yugurth, and others. All these products exhibit after a few hours a very marked acidity. The powders and tablets, however, which in themselves do not possess a high degree of acidity, are easily absorbed without getting into contact with the teeth. Unfortunately these products are not so much employed, as they have a weaker therapeutic action. The inconveniences connected with lactic ferments can be overcome by neutralizing the acid at the moment of use with sodium carbonate or calcium carbonate, but this also diminishes the therapeutic action. Neutralization of the mixture before use would be dangerous, as ferments of putrefaction would be developed. In some of these products the acidity can be considerably diminished by decanting the whey. This is of advantage under any conditions, as almost all bacilli, the active principle of the product, remain in the casein. From the dental point of view the best prophylaxis consists in rinsing the mouth after every use of lactic products, and in carefully brushing the teeth, especially at the approximal spaces, with an alkaline powder and Vichy water. The prominence into which the lactic ferments have sprung as therapeutic agents commends increased attention in regard to urinary, stomach, and dental troubles. Naturally fermented milk such as represents the chief article of food in oriental countries is polymicrobic, and not such a pure and selected culture or artificial preparation of lactic ferments and acids as sold under various names. The preparation of preference is the tablet form, as decomposition does not start before the tablets reach the intestine, and no untoward action on the upper digestive tube, the mouth, and the stomach need be feared. The author's warning is based on clinical reports of rapid multiple caries noted in patients after lactic ferment medication.

[*Deutsche Zahnaerztliche Wochenschrift*, Berlin, January 15, 1910.]

THE PUBLIC SCHOOL DENTAL CLINIC MOVEMENT. By Dr. Kunert, Breslau.

It is almost irritating to have a damper put on the enthusiasm over the public dental hygiene movement that has swept the whole civilized world, especially since the damper represented by Dr. Kunert's article is based on very valid grounds. The only fault we might find with this article is its misleading title, for far from reiterating the rather familiar arguments that have become staple in this movement, the author exposes its limitations, and points to a greater future of dental prophylaxis on the basis of a scientific solution of the bread question.

The author first scans the real usefulness of public school dental service, decrying the waste of energy invested in statistics on the condition of school children's teeth, such efforts not only making very arid reading, but also failing to awaken the parents to a notably greater care of their offspring's dental apparatus. Public school dental hygiene has an aim and effect only if class after class are set in the chair, and the mouth of each individual child is cared for. By this Kunert means the preservation of all deciduous teeth, which can only be successfully accomplished by root-canal treatment, for even roots of deciduous teeth have an important function in guiding the permanent teeth into their normal positions. To accomplish such ideal prophylaxis, the number of practicing dentists would be far inadequate. No wonder, then, that in the public school dental clinics

the forceps play an important rôle, very few root-canal treatments are instituted, and the selection of very poor children for treatment excludes the greater majority of children entirely. The dentists are not to blame for that, for no dentist can be expected to conduct charitable or poorly paid semi-charitable work in the same manner as he would a good private practice. Moreover, the treatment of children imposes an excessive strain on the operator, and it speaks well for the dental profession that its members are so willing to lend a helping hand, even though with the best of efforts the whole movement can only be a drop, and a very small one at that, in the bucket. Moreover, after the children leave the school, their teeth in the vast majority of cases are again neglected. The school dental treatment has not done the least toward improving the main cause of dental caries, poor calcification of the teeth, and predisposition to caries owing to the softness of the tooth material. Public dental prophylaxis can only be successful if all efforts are concentrated upon securing better tooth material for the people.

Kunert investigates the importance of bread in the production of dental caries. According to Von Bunge ("Text-book of the Physiology of Man," Leipzig 1901) bran bread possesses a fourfold advantage over white bread: It contains more iron, it contains more calcium, it stimulates the peristaltic action of the intestines by its contents in cellulose, and it cleanses the teeth. Most cereals as eaten today are freed from their seed-shells, and are consequently very poor in calcium and iron, these materials being present chiefly in the shells. Wheat bran, for instance, contains five times as much iron as wheat flour. In feeding-tests in rats, Von Bunge has demonstrated that animals fed on Graham bread developed far more hemoglobin than those fed on white bread, which goes to show that our present diet tends to render the individual as anemic as possible. Our present fear of "indigestible food" produces a weakening of the muscles of the intestines, and accounts for the appalling frequency of habitual constipation and appendicitis. Though it has been demonstrated by Meyer that living on white bread is financially more profitable, as white bread stays longer in the digestive tract and is used up more perfectly than bran bread, which passes the intestines more rapidly, the advantages of a diet rich in celluose by far exceed the disadvantages. In fact, the present nutrition of the child with white bread, meat, and sugar retards the development of the osseous frame. Moreover, the remarkable increase of appendicitis is directly traceable to the growing refinement of flour, persons who eat bran bread being only very rarely attacked by appendicitis. Thus, in France, where only white bread is eaten now, the military recruits show a poorer average osseous development from year to year, while in Westphalia, Hanover, Oldenburg, Schleswig-Holstein, and Mecklenburg, where dark rye bread is eaten almost exclusively, the healthiest and strongest set of men are to be found. This bread, which is the chief article of food in these provinces, is not only the most wholesome, but also leaves a more lasting sensation of satiation. Thus it seems to be an established fact that the prevalent diet of the child, which consists of white bread, meat, and sugar, retards the development of the osseous frame.

Kunert therefore concludes that if the people will come back to hard bread made of the whole grain and limit the use of meat and sugar, dental caries will be considerably reduced, and an important step toward the successful solution of the public dental hygiene problem will be accomplished.

[*Oesterreich.-Ungarische Vierteljahrsschrift fuer Zahnheilkunde*, Vienna, January 1910.]

GOLD FILLING AND GOLD INLAY. By Dr. R. Weiser, Vienna.

Numerous articles have appeared in American dental literature comparing the relative merits of the cast gold inlay and the gold filling. In Europe, where scientific investigations travel more slowly but possibly more safely, the inlay has come to its own, without, however, exciting such a storm of nervous and sometimes rather uncritical enthusiasm as we have experienced on this side of the ocean. It may be of interest to all advocates of the gold inlay—and there are probably few dentists who are not—to compare Dr. Weiser's arguments in favor of the cast gold inlay with their own: (1) The gold inlay, while requiring the same amount of skill as the gold filling, greatly facilitates

the work for dentist and patient, as the size of the filling does not prolong the operation. In some cases so many obstacles formerly presented themselves to a gold filling, that devitalization or crowning had to be resorted to, while today, with a gold inlay, the tooth can be fully restored. (2) A not quite satisfactory inlay can without much loss of time for the patient be corrected or made over before final insertion. Especially the possibility of correction of the contact point is important; for this purpose metal strips of various gages are drawn through the interproximal space, and a circular piece of pure gold plate of the same thickness as the tightly fitting gage strip is soldered at the point where the inlay appears polished by the passing of the gage strip. In this way, after careful filing and polishing, a perfect contact point is secured. (3) The insulating cement layer sufficiently compensates for or entirely neutralizes thermal shock. (4) The principle of "extension for prevention" can be applied without causing greater labor to dentist or patient. (5) Though the period of observation has not been long as yet, the intervening cement layer and the extensive use of extension for prevention seem to justify the application of inlays in the soft dentin of young patients, anemics, chlorotics, etc. (6) Over the porcelain inlay the gold inlay has the advantage that the matrix, if used at all, is embodied in the inlay, thus avoiding a source of inaccurate fit. (7) The gold inlay offers almost innumerable indications in building up corners, incisal edges, and cusps, and in prosthetic dentistry, in partial plates and bridges. Bridge work is considerably simplified, no foreign body has to be inserted between the gingivæ and the root as in hood crowns, and the patient is spared the strain of grinding and the loss of a natural crown in abutment preparations.

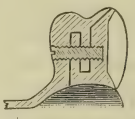
After all these considerations, it would nevertheless be wrong to detract from the merits of the gold filling method, and to discontinue its application in specially indicated cases. It would be frivolous to discredit those operators who skilfully practice and religiously cling to the old and tried method, and to ridicule them in the eyes of the public, as has been done. Nevertheless, the gold filling must surrender a great many points of indication to the cast gold inlay, which, though it still needs further development in technique and perfection, has been remarkably successful, and at least marks a great improvement in prosthetic dentistry.

[*La Province Dentaire*, Lyons, February 15, 1910.]

AN IMPROVEMENT ON THE TRANSVERSE BAR OF BRYAN IN BRIDGE WORK. By Dr. W. Thiersch, Basel.

[SECOND NOTICE.]

In our May issue, at page 607, we have reviewed the modification suggested by Dr. Thiersch for the improvement of the transverse bar of Bryan in bridge work. As this



modification seems very useful, but without an illustration may appear somewhat complicated, we have thought it well to again refer to the matter, and to insert the author's drawing (see figure) showing the construction of the bar as thus modified.

[*Deutsche Zahnaerztliche Wochenschrift*, Munich, December 18, 1909.]

SOLDERING OF GOLD, AND THE CAUSES OF CHECKING OF SOLDERED PORCELAIN FACINGS. By Dr. P. Schaefer, Breslau.

The first requirement for successful soldering is cleanliness, not only of the piece to be soldered but of all instruments used. Three requirements must be considered in the selection of an investing material: First, it must be free from foreign substances—the application of molding sand is to be condemned, as after some use it contains minute particles of metal, which may produce a discoloration of the porcelain. Second, the investment material must be sufficiently coarse or at least porous enough to allow of the evaporation of the water present. Third, the investment material must neither contract nor expand too much. A useful investment material can be made by mixing one part of fine silver sand or asbestos with two parts of plaster. In large pieces it is advisable to reinforce the

investment by embedded wires or asbestos fibers. The investment material must have completely hardened before the sticking wax is removed by boiling water, to which some soda is added in order to completely remove all fatty substances from the metal. The metal parts to be soldered must lie closely together, and, if they are of a low karat, must be scraped at the borders to be soldered. The solder should be of as high a karat as possible, generally, however, two karats lower than the gold to be soldered. It must flow easily, be about one-half millimeter thick, and resemble in color as nearly as possible the gold to be soldered. In order to dissolve the oxid forming in the flame and to prevent access of oxygen from the air to the gold or solder, both are painted with borax, which is mixed to a thick creamy consistence in a covered glass or porcelain dish. The solder should be applied in one layer, as otherwise larger borax pellets may get in between the layers, which in finishing are laid open, leaving holes in the piece. Very minute holes in the solder are produced by overheating with the needle-point flame, whereby the readily fusible metals of the alloy are burned out. On the other hand, excessive heating may produce a granulation of the platinum pins, *i.e.* the platinum alloys with the metals of the solder and becomes fragile. The case must not be heated too rapidly, as owing to the sudden liberation of the water of crystallization of the borax, the solder is distorted, and explosions might occur which would crack the investment material.

The case is best heated in a soldering furnace, or by laying it on a well-burned piece of charcoal held together on all sides by plaster, and heating the investment to a red heat with the full brush flame from below and the sides. Then the brush flame is thrown on the gold and solder, on which some dry finely powdered borax is sprinkled, when it flows. Finally, the solder is directed with the needle-point flame to the place desired. If the solder is to be molded into cusps or grooves, etc., a fairly blunt slate pencil is used; if the solder is not to flow beyond a certain limit, a pencil line is drawn which the solder will not transgress. If additional solder is required, it is taken up with pliers, in small pieces heated with the needle-point flame, and then deposited in order to avoid sudden cooling of the heated case. For very delicate soldering the mouth blowpipe is most satisfactory, as a great variety in the intensity of the flame can be produced.

All these rules for soldering assist in preventing the porcelain facings from checking. Special pains must be taken to adapt the backing as closely to the tooth as possible. This is best accomplished by making the backings of thinly rolled pure gold of one-fifth millimeter thickness, which can be burnished very accurately, and can be adapted over the incisal edge of the tooth, which by grinding is slightly beveled toward the lingual surface. If the backing is concave in shape, the metal in heating expands, closely hugging the edges of the tooth; air is thereby inclosed, and a small hollow space is formed, which by pressing upon the tooth produces the checking of a thin layer at the back of the facing. Though the tooth may seem firm, the slightest strain will suffice to break it off. If such a poorly soldered porcelain facing is examined under the magnifying glass, a line of greater refraction of light at the approximal borders is noticed, which is a valuable indication for the presence of a hollow space. The gold that has been adapted over the beveled incisal edge protects the tooth without being visible, and facilitates repairs in case the tooth is broken. The holes in the backing must be only so large and so far apart that the pins can be passed through conveniently, yet not too easily. The holes in the backing should be countersunk, especially on the side next to the tooth, in order to make room for the small porcelain cones that generally surround the pins. It is better to bend the pins than to rivet them. In order to avoid too much strain in bending, the pins are slightly notched with a metal saw at the side toward which they are to be bent. No borax must be allowed to get in between the porcelain and the backing, as it unites with the metal or the porcelain, and since the coefficient of expansion for these three materials is different, checking may occur in cooling. To avoid this the whole back of the tooth should be covered with gold foil. The thin and soft backings of 24-karat gold must be reinforced with solder up to the incisal edge; breaking of teeth is frequently due to insufficient reinforcement of the backing. All correctly treated teeth can be re-

moved from the investment before it is entirely cool. Cracks that may appear are not due to the slight change in temperature, but to any one of the previously described sources of failure.

[*Montreal Medical Journal*, Montreal, February 1910.]

REPORT OF A CASE OF EXTREME MALOCCLUSION, WITH DESCRIPTION OF THE MEASURES TAKEN FOR ITS RELIEF. By Dr. J. S. Ibbotson.

While in adults cases of bony or fibrous ankylosis in the temporo-maxillary articulations are usually seen and treated by the general surgeon, in early life this affection, with its attendant deformity and malocclusion, calls for the co-operation of the dental surgeon, and in severe cases taxes to the utmost his mechanical skill and resource.

The author reports the following unique case: E., a girl of six years of age, was first seen in March 1909. The case had been under observation since June 1904, at which time there was marked fixation and lack of development of the mandible. In June 1905, more radical treatment having been declined, under general anesthesia forcible extension of the lower jaw had been attempted, with, however, slight improvement in the range of movement. At that time the mandible showed marked angulation at the junction of the ramus and body, that is, the inner angle approximated to a right angle instead of being obtuse. The use of wooden wedges was subsequently advised, but the treatment was never seriously carried out. The range of movement gradually decreased, and the deformity due to the backward displacement and angulation of the mandible was further exaggerated by the practice of pressing food upward between the lower incisors and the hard palate, which resulted in the flattening of the arch. When seen in March of the present year, the following local conditions were noted: In profile the deformity described by the Germans as "bird-face" was most pronounced. Viewed from in front, the muco-cutaneous margin of the lower lip was invisible and lay behind the upper incisors. The latter were visible and prominent, and could be covered only by a special effort in drawing the upper lip down. The arch of the mandible was flattened, and the lower incisors were fan-shaped in arrangement, with a distinct convexity upward, the middle incisors being in contact with the mucous membrane of the hard palate, one centimeter behind the alveolar process carrying the upper incisors. Although no ulceration of the hard palate was present, an appreciable separation of the incisors from the surface of the palatal mucous membrane could not be effected. There was apparently complete ankylosis in the temporo-maxillary articulations. On palpation the posterior margin of the ramus could be felt to take a downward and backward direction toward the mastoid process of the temporal bone.

These observations were confirmed by skiagrams which, in addition, showed the secondary nuclei to be very greatly crowded, the posterior molars being directed forward instead of upward, owing to the obliteration of the broad inner angle between the body and the ramus. The skiagrams further showed the condyles to be in normal position, but very greatly broadened, the antero-posterior diameter of the neck of the condyle being as broad as the normal ramus at this age. As a consequence of this deformity and fixation of the jaw, the lingual and sublingual muscles were crowded toward the spine, causing diminution of respiratory space.

Under a general anesthetic the following operation was performed: A vertical incision, two centimeters in length, was made about one centimeter in front of either external auditory meatus, the posterior portion of the zygomatic arch removed on both sides, and the condyles excised. No trace of the normal articulations could be found. About one centimeter was removed on each side, which permitted the separation of the incisors of the mandible from the palate to the extent of two centimeters, together with a slight forward movement. Impression compound casts were taken of both the upper and lower jaws, and a temporary wedge inserted between the teeth on one side pending the preparation of permanent interdental splints. Forty-eight hours later a permanent splint was placed in position. This consisted of two lateral masses for insertion between the upper and lower dental articulations, connected by a narrow body to permit of the passage of food. Within two weeks the first splint became quite loose, and could be readily removed

and reinserted by the patient. Solid food could be masticated without difficulty, and an improvement in the general condition of the child was noted. Subsequently, the range of movement was gradually increased by inserting larger splints. The last splint has been so constructed as to produce moderate pressure on the inner surface of the lower alveolar process in front, with a view to promoting a gradual reduction of the posterior displacement of the mandible. The pressure of the body of the splint is also designed to reduce the angulation above referred to. The child has been taught to remove the interdental splint at frequent intervals, and to employ forward traction on the lower jaw by hooking the forefinger behind the arch. This practice has already aided in the reduction of the posterior displacement and of the flattening of the arch. With the eruption of the permanent teeth, which will provide secure anchorage for a metal interdental splint, together with the development of the jaw which may be looked for at puberty, it is anticipated that a normal profile may eventually be obtained.

PERISCOPE.

Removal of Stains from Teeth.—For a metallic stain, or a stain brought about by the application of iodin to a tooth containing a metallic filling, use the chlorin method. For an iron stain, other than that caused by pulp disintegration, use oxalic acid. This is more effective after the tooth has been treated by the sodium dioxid method, thus forming an oxid of iron which is soluble in oxalic acid. For silver stain, first apply iodin, thus forming an iodid, which may be dissolved by the application of a saturated solution of hyposulfite of soda. Mercury stain calls for the same treatment.—A. E. Gibson, *Australian Journ. of Dentistry.*

Successful Treatment of Chronic Alveolar Abscesses and Sinuses of the Jaws.—Chronic alveolar abscesses, with or without fistulous openings, sinuses, and abscesses of the jaws, can be cured by the injection of a 33 per cent. bismuth-vaselin paste, providing every part of the sinus or cavity has been reached, and no foreign bodies are present. (Tubercular sinuses are no exception.)

The same paste injected into pyorrhea pockets, after all obstructions and deposits are removed, is a remedy far superior to any thus far employed.

Radiographs of regions injected with bismuth paste will show all ramifications of the sinuses or abscess cavities, and trace them to the focus of their origin.

Bismuth subnitrate is a bactericidal substance which is slowly absorbed and slowly eliminated. (Kocher.) Injections up to 100 grams of the 33 per cent. paste produce no toxic effect. Larger doses may bring about symptoms of intoxication, both local and general. Before resorting to any risky operation, the paste should be tried for a reasonable length of time even in resistant cases.

The paste is an excellent dressing in suppurative cavities, inasmuch as it promotes healing of chronic suppurations, inducing rapid formation of healthy granulations.—R. Beck, *Dental Review.*

Casting Against Metal Parts.—Sections of dental bridges may be successfully cast, and the cast portion be made to pick up the anchorage pieces or backings that have been flasked with the wax. In order that this picking-up process may effect a proper union, the flask must be heated almost to the point of fusing the pieces that are to be picked up, and the gold that is introduced in the casting must be superheated quite materially. Even when these requirements have been complied with, a thorough union may possibly not be effected. This same feature is present in casting cusps on shell crowns. A safe plan in effecting unions of this kind is to solder them, after the casting has been completed. When foundations or bands are intended to be picked up, they should not contain solder or any alloy of gold lower in quality than that of which the casting is made, unless the bulk of the casting is very much smaller than the bulk of the pick-up. A small pure gold casting will successfully pick up a large platinous gold pin (as for a crown foundation), whereas, if a large molar casting of pure gold picks up small platinous

gold anchorage pins, these pins will be disintegrated immediately next to the casting and thus rendered worthless. In the latter class of work platinum or iridio-platinum should be used. The union between a platinum pick-up and a gold casting is not likely to be a fused one; therefore, in order to get a good mechanical union, these pins should be bent or headed or roughened in some way, or should have pure gold flowed on with a blowpipe before making the wax pattern.—J. G. Lane, *Items of Interest.*

Constructing a Diet.—In constructing a diet it is important to bear in mind the percentage of nitrogen and carbon in every article of food, so as to approach as nearly as possible the proper ratio of nitrogen 1 to carbon 15. The relative amounts of the different food elements are as follows:

	Ounces.
Proteids (nitrogenous matter, meat, eggs, etc.)	5
Carbohydrates (carbonaceous matter, starch, sugar, etc.)	15
Fats (carbonaceous matter, butter, lard, oil, etc.)	3
Salts	1
Water	60
Oxygen	24
Total	108

A person doing no work can subsist upon amounts smaller than those given above. A person engaged in heavy work will require a larger amount.—H. F. Slifer, *Garretsonian.*

Amalgam and Oxyphosphate Cement Fillings.—A reliable filling may in some cases be obtained by the use of amalgam blended (mixed) with oxyphosphate cement. One can use proportions of each as may suit best. The process consists in mixing the plastic amalgam, or a goodly portion of it, with the mixed-up cement. It makes a very sticky mass—if anything, more sticky than the cement alone. This mixture may be introduced into the cavity first, filling it nearly full and finishing with amalgam alone, thus making a combination base with a reasonably thick veneer of amalgam on all exposed surfaces. In such a filling we have one adhesive to the cavity walls, the thermal conductivity of which is reduced appreciably. It may be a question whether this is any better than an all-cement base with all-amalgam overlying to protect the cement; but in the first method the amalgam mix provides a better hold for the amalgam that is superimposed. There is then continuity of structure.—R. B. Tuller, *American Dental Journal.*

Dental Care of Children During First Dentition.—The first attendance upon the child in connection with the deciduous teeth which the dentist is called upon to render may consist in the treatment or assisting in the treatment of the diseases of dentition, or in the lancing of the gum tissue in order to facilitate the eruption of the deciduous teeth.

Many diseases of childhood which have been termed diseases of dentition we know now to be due to ill-feeding, nervous disturbances, or to unsanitary surroundings, and extreme care must be exercised to make a correct diagnosis. The real disease of dentition is of reflex nervous character, such as fretting, fear, sore and swollen gums, fever, etc.

The presence of stomatitis, either follicular, acute, or ulcerative, aphthæ, thrush, etc., should be readily recognized by the dentist and referred to the medical practitioner. Caution the parent to look to the feeding and feeding appliances, and recommend a wash of—Borax, gr. xxx; sodium bicarbonate, ʒj; distilled water, ℥ iv.—G. B. Mitchell, *Dental Digest.*

How to Make Chloro-percha for Lubricating Root-canals.—Select a jar which will hold about two to four ounces, and fill it about three parts with pink base-plate gutta-percha, cut up into squares or strips small enough to settle well into the bottom of the jar. Pour over this enough chloroform to fully cover the gutta-percha. Allow this to stand for a few hours, closely covered. By that time it should be fully liquid; if not, add more chloroform. Shake well, and much sediment will fall to the bottom. Gutta-perchas which we now have are loaded with zinc oxid and other materials which are not suitable ingredients of a chloro-percha for filling root-canals. To remove these, strain through some cheesecloth into a bottle with a wide mouth and an outside cover, which is not so likely to become smeared as a cork which fits inside. Finely ground thymol crystals may be dissolved in chloroform or dumped into the liquid before dissolving. Use about two to three drams of thymol to the ounce of gutta-percha. As the chloroform evaporates, add oil of cajuput to keep it liquid. After some months the chloroform will be evaporated, and the gutta-percha will be held in solution by the cajuput. This chloro-percha will be ropy and tenacious, and not as short-grained as that made from base-plate gutta-percha unstrained.—Editorial, *Dominion Dental Journal.*

Advantages of Gradual Administration of Anesthetics.—Gradual continuous administration of any anesthetic, with equal drug distribution, is one of the most important principles in anesthetization. A safer anesthesia is maintained, and at the same time the patient can be more thoroughly and safely charged with the drug, thus insuring a longer available anesthesia. The administrator better knows his patient's narcotic susceptibility, the anesthesia is more uniform, and there are no extreme fluctuations in the percentage of vapor inhaled, but a gradual anesthetic state is scientifically brought about, which insures a deeper and more lasting narcosis.—C. G. Parsons, *Items of Interest.*

Opsonic Therapy (Vaccine Treatment) in Pyorrhea Alveolaris.—Pyorrhea is an infectious disease. Cultivation from pus shows principally a growth of pneumococcus, rarely mixed with staphylococcus and streptococcus. The opsonic findings yield almost always a low index to pneumococcus, somewhat low to staphylococcus, and practically normal to the other pathogenic organisms. The treatment of pyorrheal cases with vaccine, preferably autogenous, yields good results. Autogenous vaccine treatment is of course only possible when the disease has progressed to the stage of suppuration. The systemic affections, such as rheumatic pains, etc., possibly originating from the local infections, show marked improvement while under treatment with bacterial vaccines for pyorrhea.

The use of Lugol's solution (liquor iodi compositus) as a local application, either in full strength or diluted one-half or one-fourth with water, applied by the patient once or twice a day, is to be recommended as a good adjuvant to the vaccine treatment, always remembering that the iodin solution is nothing more than a good local antiseptic.—L. S. Medalia, *Journ. of the Allied Societies.*

Sensitiveness of Devitalized Teeth in Pyorrhea Alveolaris.—A feature of cases of pyorrhea that often misleads the inexperienced is the sensitiveness to cold which occurs even in devitalized teeth. This occurs only at the beginning of an attack of inflammation. The tooth becomes sore to touch, the gums red and swollen. This must be distinguished from an alveolar abscess due to a dead and infected pulp. The unlocalized pain in the early part of an attack must be distinguished from a pulp infection due to caries; this is a hyperemia due to extension from the pericementum. Many mistakes are made owing to these conflicting symptoms. A tooth which has had attacks of calcific inflammation and sensitiveness to changes of temperature should have the pulp removed at once, or it will soon become so hyperemic that it cannot be devitalized by ordinary methods. A multi-rooted tooth which has lost the attachment of one root and developed deposits in the bifurcation, and has had attacks of calcific inflammation, might as well be at once extracted, because anything less than the full complement of roots will not carry a full crown for any length of time.—A. E. Webster, *Dominion Dental Journal.*

Gold and Platinum vs. German Silver in Orthodontia Appliances.—The alloys of gold and platinum are indestructible in the mouth. German silver is corroded, disintegrated, and its strength and working qualities are thus lost during the most important periods of treatment.

The alloys of gold and platinum do not tarnish in the mouth unless brass ligatures are used with them. German silver always discolors and presents an unsightly appearance, which no amount of polishing will entirely do away with.

It is possible to make soldered attachments directly to a gold-platinum expansion arch and not affect particularly the temper thereof. Any hard soldering upon the German silver arch destroys its temper, so that it is unfit for use.

The gold-platinum appliances are a better investment than German silver appliances, since at least seventy-five per cent. of the first cost of the gold-platinum appliances return to the operator's scrap-gold box, having a definite money value. The German silver appliances are worth nothing after having once been used.—H. A. Pullen, *Dental Summary.*

Bleaching Teeth with Pyrozone and Sodium Dioxid.—Bleaching by pyrozone has enjoyed great favor with some operators. Pyrozone is a 25 per cent. solution of hydrogen dioxid. The solution is placed in the cavity on a pledget of cotton, and warm air is applied to facilitate the breaking-up. If the discoloration is obstinate, a small quantity may be sealed in and allowed to remain in for a day. Care should be taken not to seal in too much, as it has been known to split the tooth. Pyrozone should be handled with care, as it is very explosive. A towel should be wrapped around the bottle when it is being handled, as often the heat of the hand is enough to cause an explosion.

Sodium dioxid appears in yellowish white powder. It must be tightly corked, as it is very hygroscopic. Sodium dioxid exposed to the atmosphere for twenty-four hours will ab-

sorb nearly its own weight in water. For bleaching purposes we make a saturated solution in small quantities as required, by adding the powder slowly to about one ounce of distilled water. The beaker should be kept cool by means of a wet towel. The powder is added until the solution assumes a semi-opaque appearance, indicating the saturation point. On removal of the towel, the solution will appear straw-colored. This is then applied to the cavity on pledgets of asbestos fiber, as the sodium dioxid acts on the cotton, changing it to a sticky, pasty mass that is difficult to remove and interferes with the action of the solution.

After the dentin is saturated with the above-mentioned solution, a 10 per cent. solution of sulfuric acid is added. Effervescence will be noted. Repeat the operation until the tooth is restored to its normal color.—H. J. Henderson, *Dominion Dental Journal.*

Defective Teeth and Gastro-Intestinal Diseases.—The effects of defective teeth in the production of gastro-intestinal diseases may be indicated as follows:

No particular gastro-intestinal disease is dependent solely upon defective teeth for its origin; they are not necessarily associated with gastro-intestinal disease, and, conversely, gastro-intestinal diseases are not necessarily associated with defective teeth. Defective teeth are contributing factors in the production or aggravation of most gastro-intestinal diseases, and they may be sufficient to keep up a disease process after the primary cause is no longer active. The chemical products of pyogenic organisms act in much the same way as does unchewed food in producing gastro-intestinal irritation. Finally, in the treatment of gastro-intestinal disease, where every factor must be considered, and if possible corrected, the physician should elicit the services of a skilled dentist wherever defective teeth are present, and be sure that at least this factor is eliminated or brought under control.—W. P. Elmer, *Dental Brief.*

Copper Matrix in Inserting Amalgam Fillings.—The matrix is made of sheet copper of about No. 35 gage, the thickness depending upon the closeness of the teeth. The copper is annealed and cut into the desired shape. The metal is then placed around the tooth and is secured by dental floss. It is important to secure it well at the cervix, which can best be done at the beginning by a rolling hitch. One end of the floss is then passed around the tooth one way and the other end the other way, and tied in a surgeon's knot followed by an ordinary knot. This number of strands about the tooth is usually sufficient for an amalgam filling. For gold work it is better to increase the number of strands about the tooth.

The ligature may be prevented from slipping from the tooth upon the cervix by slitting the cervical edges at two places and turning out the portion between the cuts; this should be done on at least two sides.

The occlusal portion is then spun or stretched with a burnisher, until the natural contour of the tooth is restored, and until it comes in contact with the adjacent tooth. For amalgam work the matrix should not be so high as to prevent normal occlusion. When the amalgam is well packed, the patient should be allowed to close the teeth to get the proper occlusion; the rubber dam, if it is used, is of course removed before getting the occlusion. The matrix is allowed to remain until the next sitting, when it is removed, and the filling is polished.

The advantages of the copper matrix over others are: First, the contour of the tooth can be restored; second, the filling can be built up until it is in contact with adjacent teeth; third, occlusion can be secured; fourth, the matrix may be allowed to remain on the tooth until a subsequent sitting, thus preventing the patient from injuring the filling before it is thoroughly set.—W. J. R. Akeroyd, *Frater.*

Filling Operations in Children.—If a child is fairly docile, we should always aim at doing what may reasonably be called permanent work.

Cavity preparation is sometimes a trying performance for the operator, as some children will only keep their mouths properly open for a few seconds at a time. If progress is to be made, every stroke must accomplish some definite object. To do this the tools must be in good condition, the burs should be quite new, and the excavators as sharp as stones can make them. The intervals of rest are often best employed in retouching the instrument edges for the next stroke.

If the teeth happen to be painful to excavate, a temporary filling, composed of zinc oxid and zinc sulfate, with two or three per cent. of paraform, will greatly help, and will generally make it easy to complete the filling at the next visit. I think the ideal fillings for deciduous teeth are translucent cement for the front teeth, and amalgam lined with cement for the back teeth.

Filling with translucent cement will present little difficulty; the cavities are generally of retentive shape when the decay is removed, and they can be kept dry long

enough to get the cement packed and varnished. The molars are more difficult to get at and to keep dry. A rubber dam is generally out of the question, and a saliva tube often more nuisance than assistance.

In the case of interstitial cavities, oozing from the gum may be largely prevented by application of adrenalin solution on cotton. The actual filling is accomplished by working with one hand, leaving the other at liberty to hold a cotton roll down on each side of the tooth to be filled. The instruments must, of course, be all placed in readiness, and the amalgam and cement mixed before placing the rolls in position. The cavity can then be rapidly dried, and the filling placed, before the rising flood of saliva reaches it. If the child is too young, or too easily tired for you even to accomplish this much, do not scruple to temporize until something better can be done. In very young children copper amalgam often does good service, especially in crown fissure cavities. It will hold in and preserve the tooth to quite a surprising extent, even when a minimum of excavation has been possible, and the filling has been made in a wet cavity. Another excellent material to temporize with is the pink base-plate gutta-percha.—J. B. Parfitt, *Guy's Hospital Gazette.*

Removing Wax Model and Pins Together in Cast Gold Inlays.—It frequently happens that the pins and wax do not come away together without being distorted or broken.

After drilling two parallel holes in the incisal edges of the tooth, take a piece of iridio-platinum wire and bend it in the form of a staple, so that the ends fit well down into the holes and the cross-piece is fairly snug to the edge of the tooth. After the staple is properly fitted, remove it, and to the center of the cross-piece, and at right angles to it, solder a thin piece of wire. Then soften the wax, force it to place, and shape it. Next take a pair of flat-nose pliers, and grasping the staple by the thin piece of wire, hold it in a Bunsen flame until well heated; then force it through the wax into the holes previously prepared for it. With a warm spatula the wax can be smoothed off, leaving the thin piece of wire projecting from the wax. Then chill the wax with ice-water, and by taking the end of the thin piece of wire in a pair of flat-nose pliers, the whole can be easily removed and placed on the sprue. After casting, the thin piece of wire is cut off close to the inlay.—C. F. Ash, *Items of Interest.*

Suction Plate for a Lower Denture.—To make a suction plate for a very flat or hard lower alveolar ridge, proceed as follows: Immerse the model for one hour in an alum solution—one part alum (free of iron), eight parts water; this will toughen the plaster. At any time before packing the rubber, cut in the plaster model a wedge-shaped groove, with the thin edge pointing outward. I use a blunt instrument first, and make a groove two-eighths of an inch inside the outer limits of the plate line all around the lingual, labial, and buccal surfaces, and join them at the heel of the model. Next deepen the groove gradually with a wedge-shaped sharp instrument (I use Dr. R. I. Simpson's approximal scaler No. 13) until the groove is about one-eighth of an inch deep. Always be sure to have the apex of the groove pointing away from the ridge, or rather where there ought to be one.

After packing with any rubber you choose to use, and just prior to closing the flask finally, cover the model with a generous amount of chloroform applied with a soft brush; then quickly cover the whole model with one thickness of palate or velum rubber. Be sure to get it over the grooves and work quickly before the chloroform evaporates.

I also use this method, instead of a vacuum chamber, for upper plates where the roof of the mouth is very hard. I outline a groove of the shape of a vacuum chamber, or of any shape which the hard part of the roof of the mouth may indicate.—H. J. Fenn, *Dental Brief.*

Some Difficulties in Casting Zinc Dies and How to Overcome Them.—In making any cast it is necessary that the sand should be well sifted and thoroughly mixed, so that when squeezed in the hand it breaks with a clean fracture. Old well-used sand is much better than new sand. A very difficult case frequently met with is one in which the six or eight front teeth are standing with an overhanging alveolar ridge. For this kind of cases, cores are invariably made. While cores are correct in theory, they are very difficult of successful accomplishment in practice. There is no need for them in this case, if the following instructions are carried out: Having prepared the model ready for casting in the usual way, slightly oil the teeth, gum, and model on the labial side, then build up with any core material, taking care that this reaches past the widest part of the model. After setting, trim up at an angle of about 45 degrees, separate the two parts, place together again, dust with French chalk, and

proceed in the usual way. A slight tap or a point driven into the loose piece of plaster will disengage it, leaving the model in the sand. Then, with a point tapped into the model or a piece of metal bent at a right angle and fixed with hard wax, withdraw the model on an inclined plane in the space left by the added plaster, and the model will easily leave the sand. The plaster is thoroughly dried and placed in position in the casting ring, and the zinc is poured as cool as possible. The nearer the temperature is to the melting-point, the less will be the shrinkage. The same method can be applied for full uppers with overhanging front gum, only reversing the plaster front and placing it at the back.

Another difficult case is a model with overhanging bicuspids or molars. One method commonly used is to take the plaster teeth off and cast without, fitting bands round the overhanging teeth. The following method may be better: If it has been noted in taking the impression that certain teeth are overhanging, these teeth should be pinned in the impression with strong pieces of brass wire, square in section, and pointed at one end. The pins must not lean the same way as the teeth, but must be placed in the impression quite straight. The teeth only should then be cast, and after hardening they should be oiled, and the rest of the impression poured. If after removing the impression material the teeth do not leave the model, they must be gently prized off the pins. The square pins will prevent the teeth from rotating on the model. The teeth must be easily removable from the pins, and after they have been replaced on the model, a cast is made as usual. In removing the cast from the sand, it will be found that the overhanging teeth will be left there. A pointed instrument is placed in the hole in the teeth left by the pin, and the teeth are withdrawn at the same angle as they lean. With a little practice these teeth can be successfully manipulated, and a perfect cast can be obtained.—H. W. FILLAN, *Dental Surgeon.*

HINTS, QUERIES, AND COMMENTS.

AN ORIGINAL METHOD OF CASTING HOLLOW SEAMLESS GOLD DUMMIES.

A SOLID wax model or dummy is made and trimmed to the desired shape and size, and proper occlusion is obtained. The wax cusps and buccal surfaces can be molded in any die-plate, and the angle filled in. The solid wax dummy is then hollowed out from the lingual or palatal side, the wax being drawn out with a hot-air syringe. I use the barrel of a metal syringe, with a suitable point, attached to a saliva ejector, which when heated, draws out the wax very rapidly and without danger of distortion.

The hollow dummy thus obtained is filled with investing material to make a core. A gold sprue is inserted in the investment, and allowed to extend sufficiently to engage the investment in the flask; this is to support the core, which otherwise would drop to the bottom of the mold as soon as the surrounding wax was melted.

When the core has hardened sufficiently, a piece of sheet wax is warmed, and the opening is covered with it, thus giving a wax dummy with investment compound sealed inside. A large sprue wire is inserted, and the piece is

FIG. 1.



FIG. 2.



FIG. 3.



FIG. 4.

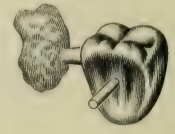
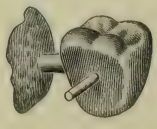


FIG. 5.



cast like any dummy or inlay. The result is practically a hollow dummy with walls of any desirable thickness, perfectly sealed without soldering, and which is easily and quickly made.

The advantages of this method are obvious.

Another method which gives equally as good, if not better results, is the use of a diatoric tooth for a core, and casting around it, the recess in the tooth being filled with investment compound for attachment to the supporting sprue.

Fig. 1 represents the hollow wax dummy.

Fig. 2, dummy filled with investment compound supporting sprue in place.

Fig. 3, with investment compound sealed in.

Fig. 4, gold dummy cast around investment compound core.

Fig. 5, copper dummy cast around diatoric tooth.

The unpolished copper dummy is cast around a diatoric molar. If desirable, both dummies can be cut into, or a cross section thereof can be made.

L. C. Elkins, D.D.S.

St. Augustine, Fla.

PORCELAIN CROWN WORK.

It is an acknowledged fact that in the replacement of the six anterior natural teeth nothing is superior to a well-fitting porcelain crown; but we all know how nearly impossible it is to make porcelain crowns fit perfectly after the old method, and, if the root-canal has been enlarged by caries until it is larger than the anchor post, our troubles are multiplied. Modern casting methods, however, have made it possible to produce a perfectly adapted porcelain crown. Our experience suggests the following stages of procedure:

(1) Prepare the root, cutting the labial portion well under the gum, so that the gold will not show on the finished crown.

(2) Take a crown with removable pin, either of platinum, iridio-platinum, or platinum and silver, as base metals will not stand the heat, and adjust the crown to the root, cutting away about one-thirty-second of an inch from the lingual portion of the porcelain crown.

(3) Place a piece of casting wax around the pin next to the porcelain, force it to place, trim, and re-adjust. If the root is badly decayed, ream it out until you reach solid tooth substance, and force the wax down into the canal around the pin.

(4) Remove the pin from the crown, and invest, then cast with 22-karat or pure gold in the usual manner.

On cementing the crown to place it will be found that instead of being a little too large or too small, or having an imperfect joint, which has to be filled with cement that later offers a lodging-place for decaying particles of food, a substantial crown is obtained with perfect adaptation to the end of the root, and one which is comfortably tolerated by the surrounding tissues.

F. H. Bigness, D.D.S.

Alexandria Bay, N. Y.

OBITUARY.

DR. JAMES W. CURTIS.

Died, at Brunswick, Me., March 29, 1910, of appendicitis, James W. Curtis, D.D.S., in his sixty-eighth year.

By the death of Dr. James W. Curtis the dental profession has lost one of its most honored members, and the community of Brunswick one of its foremost citizens.

Dr. James W. Curtis, the son of Paul and Charity Curtis, was born at Cundy's Harbor, Harpswell, Me. At an early age he moved to Brunswick, where he attended the public schools.

Living in a seafaring town where the ambition of a young man was to become master of a ship, he made several voyages around the Horn. Not finding the seafaring life to his taste he returned to Brunswick, where he entered the office of Dr. J. H. Lombard for the study of dentistry.

After serving his apprenticeship with Dr. Lombard he practiced at Mechanic Falls and Norway, Me. Finding more study necessary to perfect himself in his profession, he attended courses in the Maine Medical School, subsequently being graduated from the Har-

vard Dental School, in the class of 1872. He then settled in Brunswick, Me., where he successfully practiced dentistry until the time of his death.

Dr. Curtis was a man of genial and kindly disposition, loved and esteemed by all who knew him. He always stood for the best of everything in the profession as well as for the best of everything in civic life.

He had a great love for the beautiful, taking great pleasure in collecting colonial furniture and china, of which he had a valuable collection.

Dr. Curtis was a member and former president of the Maine Dental Society, a member of the Northeastern Dental Society, and honorary member of the Harvard Odontological Society; he was also a member of United Lodge F. and A. M., St. Paul's Chapter, Dunlap Commandery, of the Brunswick Historical Society, Brunswick Club, and Gentleman's Club of Brunswick.

In 1874 he married Miss A. Anna Snow, who, together with a son, Dwight S. Curtis of Lynn, Mass., survives him.

Brief Necrology.

Dr. J. A. Arrington of Jackson, Tenn., March 2, 1910.

Dr. Ezekiel Miller of Nyack, N. Y., April 24, 1910, of heart failure.

Dr. V. H. Hobson of Lexington, Ky., March 15, 1910, from fracture of the skull.

Dr. L. A. Nearing of Syracuse, N. Y., April 6, 1910, in his eighty-seventh year.

Dr. Wm. Decker of Oshkosh, Wis., March 24, 1910, of apoplexy, in his eighty-fifth year.

Dr. Andrew Jackson Harris of Chicago, Ill., December 16, 1909, in his eightieth year.

Dr. Edward E. Nathan of Chicago, Ill., April 18, 1910, in his twenty-seventh year.

Dr. L. S. Andrews of Austin, Ill., March 26, 1910, of heart failure, in his forty-third year.

Dr. J. J. Cornelius of Chicago, Ill., March 17, 1910, of blood poisoning contracted from contact with an ulcerated tooth, in his fifty-eighth year.

Dr. F. C. Briggs of Cleveland, O., March 25, 1910, of old age, in his eighty-seventh year.

Dr. J. O. Gilbert of Atlanta, Ga., April 16, 1910, of heart trouble, in his thirty-seventh year.

Dr. John D. Heckman of Champaign, Ill., March 17, 1910, of pneumonia, in his forty-fifth year.

Dr. James Marple of Sherrard, W. Va., March 24, 1910, of disease of the liver, in his forty-sixth year.

Dr. E. Treat Payne of Noroton, Conn., April 15, 1910, in his seventy-third year. Deceased was a veteran of the civil war.

Dr. J. M. Harrod of Scottsburg, Ind., February 24, 1910, in his sixty-first year, of heart disease. Deceased was a veteran of the civil war.

Dr. Benjamin F. Treat of Polo, Ill., May 5, 1910. The deceased was a member of the Illinois Dental Society and the Stephenson County Dental Society.

Dr. Chas. Mermillod of New Orleans, La., March 17, 1910, of paralysis, in his seventy-seventh year. Deceased was a member of the Louisiana State Dental Society.

Dr. Solomon Freeman of New York city, N. Y., March 30, 1910, of double pneumonia, in his forty-ninth year. The deceased was a graduate of the Dental Department of the University of Pennsylvania.

Dr. Justus Crane Burroughs of Bedford, O., March 30, 1910, in his eighty-seventh year. Deceased graduated with the first class of the Western Reserve University, and was one of the first to apply the process of vulcanizing rubber in dental plate work.

Dr. James Gregory Palmer of Brooklyn, N. Y., March 28, 1910, of heart disease, in his sixty-first year. Deceased was a graduate of the Pennsylvania College of Dental Surgery of Philadelphia, Pa., and member of the New York Odontological Society and of the Institute of Stomatology, and was at one time president of the Central Dental Association of Northern New Jersey.

Dr. WILLIAM COFFIN STARBUCK of Jamaica Plain, Mass., February 27, 1910, in his ninety-third year. The deceased first introduced the use of ether in Spain and Portugal, and was appointed dentist to the royal family of Portugal. For many years he was secretary of the Massachusetts Dental Society.

Dr. MERIT WELLS of Indianapolis, Ind., March 2, 1910, in his sixty-eighth year, of pneumonia. Deceased was a graduate of the Cincinnati Dental College, one of the organizers of the Indiana Dental College, and treasurer thereof for many years, also a member of the Indiana State Dental Association.

DENTAL COLLEGE COMMENCEMENTS.

MEHARRY DENTAL COLLEGE.

THE annual commencement exercises of the Meharry Dental College were held on Thursday evening, April 14th, in the Ryman Auditorium, Nashville, Tenn.

An address to the graduates was delivered by Rev. R. E. Jones, D.D.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

J. Q. Adams ..... North Carolina	W. C. Mitchell ..... West Virginia
E. P. Allen ..... Texas	Maude L. Moses ..... Texas
J. C. Childress ..... Mississippi	H. B. Rosby ..... Kentucky
J. J. Creagh, A.B. ..... Danish West Indies	Sarah C. Shelton ..... Tennessee
H. K. Culler ..... South Carolina	D. A. Stewart ..... British West Indies
T. B. Davis, A.B. ..... South Carolina	Claud T. Talley ..... Kentucky
Tobias Gallant, B.S. ..... South Carolina	A. W. Thompson ..... Tennessee
W. M. Glover, A.B. ..... South Carolina	O. M. Thompson ..... South Carolina
L. W. Hale ..... Tennessee	C. A. Tomlinson ..... British West Indies
Ida Mae Hiram ..... Georgia	E. A. Welters ..... Florida
L. A. Howell ..... Florida	W. A. Willis ..... Louisiana
R. G. Johnson ..... Mississippi	J. M. Wright, A.B. ..... South Carolina
Roderick Johnson ..... Texas	Annie E. Yarbourgh ..... Georgia

ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO.

THE annual commencement exercises of the Royal College of Dental Surgeons were held in Toronto, Ont., Friday, May 6, 1910.

An address to the graduates was delivered by Dr. Wm. Pakenham, dean.

The degree of Licentiate of Dental Surgery was conferred by G. C. Bonnycastle, president, on the following graduates:

Thomas Wilmot Bleakley	Sadie Holmes	Arthur Charles McKenna
Charles Wesley Brown	Gustavus John Hope	James Albert McTaggart
Roy Hugh Browne	John Mansfield Hughton	Arnold Rea
Warren Edward Bruce	Simon Herbert Hutt	Harold Mills Richardson
James Berton Carmichael	Andrew Clinton Kerr	Edwin H. Robinson
Norman Caven Carmichael	James Chisholm King	William Ross Rodger
Charles H. Chamberlain	Myron Lewis Laidlaw	William Reid Somerville
Alan Lipsey Church	Frederick George Law	Albert Edwin Slack
Thomas Walter Dawson	Sangster Lederman	Walter W. Sleeth
James Durran	H. R. Marshall	Otto Levi Weaver
Thomas Carlyle DeMille	Lloyd LeRoy Matchett	Charles Harry Weicker
Charence Eli Eastwood	Herbert Stuart Macartney	Ivan J. Wigle
Orvil A. Elliott	John Spurgeon McDougall	Charles Edward Williams
George Bucton Hardy	R. M. McIntosh	William Elphiston Wray
Peter John Healey	Charles Roy McIntyre	Eric Lyons Young

KANSAS CITY DENTAL COLLEGE.

The twenty-ninth annual commencement exercises of Kansas City Dental College were held in the First Presbyterian Church, Kansas City, Mo., May 14, 1910.

An address was delivered by Rev. Geo. H. Combs.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Robert Verne Barber
Gustave Charles Buhler
Arthur Julius Butel
John Otis Cheney
Ralph Lawrence Christy
Ralph Edward Crabbs
Benjamin Harrison Crawford
Harvey Marion Deaver
Marion Albert Dickey
John Edward Dryden
Alfred Ross Goodwyn
Harold Edwin Glander
Charles Elmer Hill
Oscar Lenox Hummel
Charles Omer LaShelle
Lewis Henry Lanier
John Gallop Leftwich
Frank Forrest Logan
Frank Wallace Ludwig
Chauncey Harland McCune
John Wesley McGlathery
George Clement Machette
Charles Roy Maddox
Robert Firman Merryman
Auffredy John Oakes
John William Potter
Clyde Melvin Roush
William Roy Saylor
Arthur Jewell Schumacher
DeWitt Wilton Smith
Della Lemuel Stark
Daniel Lafayette Taylor
Ralph Horton Teall
Thomas Harold Tye
Harrison Martin Walker

CINCINNATI COLLEGE OF DENTAL SURGERY.

The commencement exercises of the Cincinnati College of Dental Surgery (Dental Department of Ohio University) were held on May 12, 1910, at 8 P.M., in the Business Men's Club, Chamber of Commerce Bldg., Cincinnati, Ohio.

Addresses were made by the dean, G. S. Junkerman, A.M., M.D., D.D.S., Dr. Alston Ellis, president of Ohio University, and Prof. E. W. Wilkinson.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Joseph F. Hill — Isadore H. Kessler — Chas. R. Morris — Lyle G. Morton

BALTIMORE COLLEGE OF DENTAL SURGERY.

The seventieth annual commencement exercises of the Baltimore College of Dental Surgery were held in Albaugh's Theater, Baltimore, Md., on May 17, 1910.

An oration was delivered by Hon. Thos. G. Hayes, and the valedictorian was David Roy Kennedy.

The degree of Doctor of Dental Surgery was conferred by the dean, M. W. Foster, M.D., D.D.S., on the following graduates:

O. D. Bacheler	New Jersey	J. J. Gearon	Rhode Island
R. M. Bannon	Rhode Island	C. W. Gilmartin	Massachusetts
J. L. Benson	Massachusetts	J. B. Goodall	New Jersey
J. G. Blevins	Virginia	O. H. Heininger	Vermont
W. F. Buck	Canada	M. Kahn	New York
P. P. A. Chesser	Virginia	D. R. Kennedy	Massachusetts
A. J. Cormier	Canada	J. E. King	Massachusetts
W. L. Dietz	Pennsylvania	T. J. Lally	Massachusetts
H. G. Dudley	Virginia	W. J. Leahy	Canada
V. R. Dyer	New Jersey	I. Lebergott	Maryland
F. B. Ferris	Massachusetts	R. B. Lillard	Texas

A. C. Lingley	Massachusetts
W. K. Mackay	Vermont
A. L. McKibbin	Pennsylvania
E. J. McQuillan	Massachusetts
J. H. McTyre	Georgia
R. J. Murray	Connecticut
E. A. O'Connor	Pennsylvania
P. M. Odio	Cuba
A. A. Rousseau	Connecticut
W. H. Ryan	Connecticut
H. E. Smith	Massachusetts
D. C. Sutherland	Maryland
F. V. Villilla	Porto Rico
J. A. Warren	Massachusetts
H. C. Watson	Texas
E. P. Wright	Texas

VANDERBILT UNIVERSITY, DEPARTMENT OF DENTISTRY.

THE annual commencement exercises of the Department of Dentistry, Vanderbilt University, were held in Nashville, Tenn., May 14, 1910.

An address was delivered by Dr. Herbert C. Tolman.

The degree of Doctor of Dental Surgery was conferred by Chancellor J. H. Kirkland on the following graduates:

R. E. Adams	Tennessee
H. I. Benedict	Tennessee
G. H. Elliott	Tennessee
J. B. Emison	Tennessee
H. E. Ezell	Texas
A. W. Farnsworth	Kentucky
J. F. Fisher	Louisiana
F. C. Gatlin	Louisiana
D. W. Gibson	Louisiana
T. K. Goolsbee	Texas
J. E. Harper	South Carolina
W. L. Harrison	Tennessee
W. B. Hart	Texas
J. B. Jones	Tennessee
W. W. Killian	Texas
B. W. Klingeman	Texas
W. H. Lingard	Louisiana
V. O. Marshall	Texas
N. B. McCants	Alabama
H. G. McKowen	Louisiana
E. G. Monroe	Tennessee
H. W. Pearce	Central America
J. L. Preston	Texas
F. B. Reeder	Alabama
J. L. Reynolds	Alabama
E. F. Richards	Tennessee
T. J. Richardson	Tennessee
N. B. Taylor	Texas
M. Tomisawa	Japan
J. L. White	Alabama
Bob Younger	Texas

SOUTHERN DENTAL COLLEGE.

THE annual commencement exercises of the Southern Dental College were held in the Grand Opera House, Atlanta, Ga., May 5, 1910.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

John B. Acree
Paul R. Anderson
Charles L. Appleby
Mayes M. Baker
Edward M. Belk
Lee F. Blackman
C. T. Brooks
Alice P. Butler
Claud S. Burden
Curtis Coleman
Harry D. Dodd
Alexis M. Durham
Linwood I. Evans
William P. Edwards
Marcellus M. Forbes
R. Andrew Fry
John A. Fuller
John T. Green
Frank C. Grogan
O. L. F. Haggard
Charles N. Hawkins
Edward H. Hawkins
Ralph H. Johnson
George L. Keith
John Carrol Kinard
C. S. Lazenby
Charles David Leverett
A. Brooks McCoy
Charles H. McAnally
James M. McLees
S. D. McCotter
Thomas C. Mason
Edward T. Mincey
Rex E. Meyers
Seward O'Quinn
Cleveland M. Peeler
Eulous T. Portwood
Floyd L. Rackley
S. F. Red
J. C. Self
T. A. Seawright
M. R. Sewell
Samuel Lawrence Silverman
Samuel J. Smith
Frank Taylor
James Griffin Williams
Robert F. Windham
Cale M. Yearwood
William S. York

STARLING-OHIO MEDICAL COLLEGE.

The third annual commencement exercises of Starling-Ohio Medical College were held in Columbus, Ohio, Wednesday, May 18, 1910.

An address was delivered by the Hon. O. T. Corson.

The degree of Doctor of Dental Surgery was conferred by Dr. W. O. Thompson, president of the board of trustees, on the following graduates:

Edgar Leonard Bailey
Orval Ainsworth Bonar
Herbert Clifford Butler
Arthur Stanley Butler
F. Willard Cockerill
Arthur Lawrence Gindrup
Ralph Waldo Guthridge
Frank Defigh Hamilton
Clyde Howard Hebble
Clyde Clay Keltner
Verner Clyde Kissell
Edward Ernest Linkenbach
Clarence Henry Lose
Leo Nicholas Martin
Samuel Neff McKelvey
La Vere Abraham Miller
Leo Earl Moore
Wilson Peart
Alma Marie Phillips
Fred Charles Porter
Samuel John Randall
Harry Everett Routzong
Earl John Russell
Charles David Sharp
Frank William Stine
Raymond Arthur Weckesser
William Frank Wilson

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS: June, July, and August.

JUNE.

American Medical Association, Section on Stomatology. St. Louis, Mo. Four days: June 7th to 10th.

California State Dental Association. San Francisco. Four days: June 22d to 25th.

District of Columbia Dental Society and Maryland State Dental Association. Baltimore. Three days: June 9th to 11th.

Florida State Dental Society. St. Augustine. Three days: June 23d to 25th.

Georgia State Dental Society. Atlanta. Three days: June 14th to 16th.

Maine Dental Society. Rangeley. Three days: June 23d to 25th.

Maryland State Dental Association and District of Columbia Dental Society. Baltimore. Three days: June 9th to 11th.

Massachusetts Dental Society. Springfield. Three days: June 14th to 16th.

Michigan State Dental Society. Detroit. Three days: June 13th to 15th.

Northern Ohio Dental Association. Toledo. Three days: June 7th to 9th.

Oregon State Dental Association. Portland. Three days: June 30th to July 2d.

Pennsylvania State Dental Society. Harrisburg. Three days: June 28th to 30th.

South Dakota State Dental Society. Pierre. Two days: June 9th and 10th.

Southern California Dental Association. Los Angeles. Three days: June 16th to 18th.

South Carolina State Dental Association. Glenn Springs. Four days: June 28th to July 1st.

Southern Wisconsin Dental Association. Janesville. Two days: June 2d and 3d.

JULY.

National Dental Association. Denver, Colo. Four days: July 19th to 22d.

National Association of Dental Examiners. Denver, Colo, July 25th.

National Association of Dental Faculties. Denver, Colo. July 25th.

Dental Faculties Association of American Universities. Denver, Colo. July 18th.

Delta Sigma Delta Fraternity. Denver, Colo. July 18th.

New Mexico Dental Society. Las Vegas. Three days: July 16th to 18th.

New Jersey State Dental Society. Asbury Park. Four days: July 20th to 23d.

North Carolina Dental Society. Wrightsville. Four days: July 13th to 16th.

Psi Omega Dental Fraternity. Denver, Colo. July 18th.

Wisconsin State Dental Society. Ashland. Four days: July 12th to 15th.

AUGUST.

Virginia State Dental Association. Staunton. Three days: August 3d to 5th.

Examiners' Meetings.

Arkansas Board of Examiners. Little Rock. June 6th and 7th.

Connecticut Dental Commissioners. Hartford. June 16th to 18th.

District of Columbia Board of Examiners. Washington. June 20th to 22d.

Florida Board of Examiners. St. Augustine. June 23d to 25th.

Illinois Board of Examiners. Chicago. June 13th.

Indiana Board of Examiners. Indianapolis. June 13th to 16th.

Iowa Board of Examiners. Iowa City. June 6th.

Kansas Board of Examiners. Topeka. June 21st.

Maine Board of Examiners. Portland. July 5th.

Massachusetts Board of Registration. Boston. June 1st to 3d.

Michigan Board of Examiners. Ann Arbor. June 20th to 25th.

Minnesota Board of Examiners. Minneapolis. June 6th to 9th.

Montana Board of Examiners. Helena. July 11th to 13th.

Nebraska Board of Examiners. Lincoln. June 27th.

New Hampshire Board of Registration. Manchester. June 1st to 3d.

New Jersey Board of Registration. Trenton. July 5th to 7th.

North Carolina Board of Examiners. Wrightsville. July 11th.

Ohio State Dental Board. Columbus. June 21st to 23d.

Pennsylvania Board of Examiners. Philadelphia and Pittsburg. June 8th to 11th.

Rhode Island Board of Registration. Providence. June 28th to 30th.

South Carolina Board of Examiners. Glenn Springs. June 24th to 28th.

South Dakota Board of Examiners. Sioux Falls. July 6th to 8th.

Texas Board of Examiners. Houston. June 13th.

Vermont Board of Examiners. Montpelier. July 5th to 7th.

Virginia Board of Examiners. Richmond. June 14th.

West Virginia Board of Examiners. Wheeling. June 8th to 10th.

Wisconsin Board of Examiners. Milwaukee. June 20th.

Wyoming Board of Examiners. Cheyenne. July 5th to 7th.

W. D. MILLER DENTAL CLUB OF PITTSBURG.

The W. D. Miller Dental Club of Pittsburg, Pa., was organized in December 1909, with the object of promoting the educational interests of its members.

Joseph N. Katz, *Sec'y.*

AMERICAN MILLER MEMORIAL.

All dentists at home and abroad are debtors to the late W. D. Miller, whose scientific mind, untiring energy, and pride in American citizenship have been potent factors in placing this country at the head of the profession.

Let the old adage, "A prophet is not without honor save in his own country," be the exception in this instance, and let every loyal American be represented in a lasting memorial to his useful life.

The proposed bronze will be erected in the capital city of his native state, that he may share the well-merited distinction of being one of our greatest men.

The invitation to contribute is extended individually and collectively through the societies of the country, and your support, both moral and financial, is urgently solicited.

Executive Committee—Edward C. Mills, Columbus, Ohio; J. R. Callahan, Cincinnati, Ohio; S. D. Ruggles, Portsmouth, Ohio.

In order that the work may be quickly and efficiently accomplished, contributions may be sent direct to the Treasurer of the American Miller Memorial Fund.

Weston A. Price, *Treasurer,*
10406 Euclid ave., Cleveland, Ohio.

The Meetings at Denver.

COMMUNICATION FROM THE PUBLICITY COMMITTEE, N. D. A.

THE National Dental Association, the National Association of Dental Examiners, the National Association of Dental Faculties, the American Society of Orthodontists, the Delta Sigma Delta Fraternity, and the Psi Omega Dental Fraternity, all meet at Denver during July.

Sigma Delta Fraternity, and the Shirley Hotel will be the headquarters for the National Association of Dental Faculties. These hotels are all located at the intersection of Seventeenth st. and Broadway. Street-cars connect them with the Union Depot, which is at the foot of Seventeenth st.



SILVER LAKE AND THE SNOWY RANGE.
(Published by courtesy of "Switzerland Trail" Route.)

The hotels of Denver are numerous and adequate. Accommodations may be had for $1.00 per day and up for room without bath and $2.00 per day and up for room with bath. A fair average rate will be about $2.00 and $3.00 for one and two persons respectively in room without bath, and $2.50 to $4.00 with bath. Rooms and board may also be had in private families.

The Brown Palace Hotel will be the headquarters for the National Dental Association, the American Society of Orthodontists and the Psi Omega Dental Fraternity; the Savoy Hotel will be the headquarters for the National Dental Association, the National Association of Dental Examiners and the Delta

Reservations for accommodations at the Brown Palace Hotel, the headquarters for the National Dental Association, should be made in advance through the Publicity Committee.

The entire business of the National Dental Association will be conducted under one roof —the Auditorium—one of the largest convention halls in America. This building, owned and managed by the city, is absolutely fireproof, and is so designed that part of it can be used as a theater, seating about 4000 people, leaving ample committee rooms and abundant space for clinics and exhibits. All of these features can be operated without interference with each other.

The following firms will exhibit:

S. S. White Dental Mfg. Co.
Harvard Co.
A. C. Clark Co.
Dentists' Supply Co.
Eli Lilly & Co.
Horlick's Malted Milk Co.
Kolynos Co.
Chas. H. Phillips Chemical Co.
Ritter Dental Mfg. Co.
W. A. Ivory.
W. V-B. Ames Co.
Apothecaries Co.
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All indications are that the meeting will be a large and interesting one, with a good attendance from all parts of the country. As this will be the first meeting of the National west of the Mississippi river, many will want to attend for the sake of the meeting and the opportunity to see some of the many attractions for which the state of Colorado and the city of Denver are noted.

Colorado is called the "Switzerland of America." President Roosevelt said it is the "Playground of America," and Denver, the gateway to this wonderful scenery, is justly known as the "Queen City of the Plains." Situated fourteen miles from the foothills, it commands a view of over two hundred and fifty miles of mountains, while the breezes from these snow-capped peaks, together with its altitude of one mile above sea level, provide a climate at once restful and exhilarating.

All who come to Denver, if they would see the real beauties of Colorado's mountains, should avail themselves of some of the innumerable opportunities for outings.

There are trips occupying a few hours, a day, or more time; in fact, trips to suit the purse or time of all, each with its special charm, worth seeing, and to be remembered always. To enumerate all in this article is out of the question, but a few examples may be mentioned: The far-famed Georgetown Loop and Mt. McClellan trip, which reaches an altitude of 14,007 feet, is the highest point reached on any regular railroad in the world.

Boulder, where the Colorado Chautauqua is located, is thirty miles from Denver, one hour's ride, or continuing the trip one may take the "Switzerland Trail" route, another of the one-day excursions out of Denver.

Morrison and the Garden of the Titans, which rivals the world-renowned Garden of the Gods at Colorado Springs, is an hour's ride from Denver.

In Platte Cañon, a favorite resort for fishermen, from one to three hours' ride, the railroad follows the cañon of the South Platte river for about fifty miles, where there are many hotels, cottages, and camping-places.

The Moffat Road, in course of construction from Denver to Salt Lake City, is now completed through to Steamboat Springs in the northwest corner of the state. Three hours' ride from Denver it crosses the Continental Divide at an altitude of 11,000 feet. It has opened up an empire hitherto almost untouched by the hand of civilization; a country rich in delights to the lover of nature, the hunter, and the fisherman.

Estes Park has become so famous that it promises to be a rival of the other wonderplaces of the country, such as the Yellowstone National Park and the Yosemite Valley, and is reached in three hours by train and automobile. A movement is now under way to convert this into a National Park.

One may see Colorado Springs, with her beautiful homes and excellent hotels, and Manitou, at the base of Pike's Peak, from where one may ascend the mountain by cog-wheel train or visit the Garden of the Gods and other picturesque places; Cripple Creek and Victor, the gold-mining camps, can be reached in two hours from Colorado Springs over railroads traversing most beautiful mountains. For longer trips, if one has the time, there is the Midland Road, through Ute Pass, Hellgate, and down the Fryingpan river, famous as a trout stream; or take the Denver & Rio Grande through the Royal Gorge over Tennessee Pass and through the Eagle River Cañon to Glenwood Springs, from which point both roads follow down the Grand River Cañon to Grand Junction, which is the heart of the famous peach and apple district.

"*The Trip Around the Circle.*" Nowhere in the world are there a thousand miles of railroad travel with so much of the beautiful and so many features of interest, scenic and historical, than are to be seen on the "Around the Circle Trip." This passes through Alamosa in the center of the San Luis Valley, through Durango, Silverton, Ouray, and Telluride; through two Indian reservations and the Mesa Verde National Park, set apart by the government to protect the prehistoric "Ruins of the Cliff-dwellers."

Side-trips from this tour can be taken to the Wheeler National Park near Wagon Wheel Gap, on the Rio Grande del Norte, to Pagosa Springs, and to the wonderful natural bridges of southeastern Utah. The Royal Gorge is seen on this trip and either the Black Cañon of the Cunnison and Marshall Pass, or the Grand River Valley and Glenwood Springs.

It would be out of place to pass without mention of the Hot Mineral Springs of Colorado.

When America shall have made its mark in the pages of classic history, the people of the globe will be making both winter and summer tours across the oceans to the famous watering places of Colorado, at Glenwood Springs, Pagosa Springs, Sulphur Springs, and Steamboat Springs. Few people realize the size, variety, and medicinal value of these springs, the ease of access to them, the delightful summer and winter climatic conditions, and the excellent accommodations to be had.

It is hoped that all dentists who come will bring their wives and families with them, as the ladies and children will derive quite as much pleasure and benefit from a vacation in Colorado.

The committee has arranged to devote the day following the adjournment of the National to an entertainment which will be in keeping with the season and environment.

The railroads running into Denver are: The Union Pacific, Burlington, Rock Island, Santa Fe, Missouri Pacific, Denver & Rio Grande, Colorado & Southern, the Colorado Midland, and the Moffat Road. Summer excursion rates will prevail from all parts of the country, and a more complete announcement will be made next month. From the East round-trip rates to Colorado common points are: Chicago, $30.00; St. Louis, $25.00; Omaha and Kansas City, $17.50.

N.B.: It is not generally known that these tickets can be purchased through to Colorado Springs and Pueblo at the same rate as to Denver. By doing this the tourist can visit the numerous points of interest south of Denver (Colorado Springs, Manitou, the Garden of the Gods, Pike's Peak region, Pueblo, etc.), without any additional expense for transportation. These tickets allow unlimited stop-overs, within final limit, in both directions at Denver and Colorado Springs, giving all the time desired to attend the convention, take in the side trips, etc. Tickets may be validated for return passage at either of the points mentioned, leaving it optional with the purchaser whether the ticket be used south of Denver.

Rates from Texas and the South will be one and one-third fare for round trip.

Rates from the Pacific Coast and return, $55.00.

Rates from Salt Lake City, Ogden, and other Utah common points and return, $22.50. From Utah branch-line points add one and one-third fare to main-line junction points. Dates of sale July 16th and 17th, final return limit August 15th. Stop-overs in either direction within final limit, no validation to be required.

Local offices for the assistance and direction of guests will be established at the Union Station, the Brown Palace Hotel, and the Auditorium.

Immediately upon arrival, visitors are requested to register and give forwarding instructions for mail. In case any change of address is made while in the city, they are requested to notify the committee at once.

Mail addressed "care National Dental Association, Denver, Colo.," will insure prompt delivery.

To avoid confusion, all matters pertaining to hotels, railroads, mail, and addresses of visitors, and information in general will be handled through the Publicity Committee.

For detailed information, vacation suggestions, estimates, etc., write

Dr. H. F. Hoffman,
Ch'man Publicity Committee, N. D. A.
612 California bldg., Denver, Colo.

NATIONAL DENTAL ASSOCIATION MEETING

Denver, Col., July 19–22, 1910.

Officers.

Burton Lee Thorpe, St. Louis, Mo., *President.*

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Pharmacopeial Convention.

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W. R. Clack, Clear Lake, Ia.
F. W. Low, Buffalo, N. Y.

Organization of Sections.

Section I.

Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

Geo. H. Wilson, *Chairman*, Cleveland, Ohio.
Stanley L. Rich, *Vice-chairman*, Nashville, Tenn.
B. Frank Gray, *Sec'y*, Los Angeles, Cal.

Section II.

Operative Dentistry, Nomenclature, Literature, Dental Education, and Allied Subjects.

L. L. Barber, *Chairman*, Toledo, Ohio.
F. I. Shaw, *Vice-ch'man*, Seattle, Wash.
F. L. Platt, *Secretary*, San Francisco, Cal.

SECTION III.

Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects.

WM. CARR, *Chairman*, New York, N. Y.
L. F. LUCKIE, *Vice-ch'n*, Birmingham, Ala.
RICHARD SUMMA, *Secretary*, St. Louis, Mo.

Clinics.

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A. O. ROSS, Columbus, Ohio.
J. D. TOWNER, Memphis, Tenn.
J. B. HOWELL, Paducah, Ky.
L. B. MCLAURIN, Natchez, Miss.
J. H. LORENZ, Atlanta, Ga.
F. L. HUNT, Asheville, N. C.
J. G. FIFE, Dallas, Tex.
W. G. DALRYMPLE, Ogden, Utah.
R. D. ROBINSON, Los Angeles, Cal.
C. S. IRWIN, Vancouver, Wash.
F. R. HENSHAW, Indianapolis, Ind.
H. G. NOTTAGE, Portland, Ore.
F. L. WRIGHT, Wheeling, W. Va.
R. L. SIMPSON, Richmond, Va.
A. P. BURKHART, Buffalo, N. Y.
S. W. BOWLES, Washington, D. C.
T. M. HAMPTON, Helena, Mont.
J. BRUCE PERRIN, Des Moines, Ia.
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W. T. CHAMBERS (*ex-officio*), Denver, Col.

Chairmen of Sub-Committees.

Publicity—H. F. HOFFMAN, Denver, Col.
Clinics—A. W. STARBUCK, Denver, Col.
Exhibits—JOHN STEELE, Denver, Col.
Entertainment—I. C. BROWNLIE, Denver, Col.

The following preliminary program is announced:

PROGRAM.

Section I.

Weston A. Price, Cleveland, Ohio: "The Laws Controlling the Behavior of Gold in Fusing and Casting."

Discussion by Clarence J. Grieves, Baltimore, Md.; Charles Channing Allen, Kansas City, Mo.; Thomas P. Hinman, Atlanta, Ga.; C. R. Baker, Davenport, Iowa, and Chas. L. Alexander, Charlotte, N. C.

J. Leon Williams, London, England: "Anatomical and Esthetic Prosthesis."

Discussion by C. R. Turner, Philadelphia, Pa.; A. W. Starbuck, Denver, Colo.; B. J. Cigrand, Chicago, Ill.; E. S. Gaylord, New Haven, Conn., and N. S. Hoff, Ann Arbor, Mich.

Levitt E. Custer, Dayton, Ohio: "The Bleaching of Porcelain Fillings."

Discussion by Joseph Head, Philadelphia, Pa.; D. O. M. LeCron, St. Louis, Mo.; Craig M. Work, Ottumwa, Iowa; H. C. Ferris, Brooklyn, N. Y., and J. Allen Smith, Colorado Springs, Colo.

J. Lowe Young, New York city: "Deficient Development of the Deciduous Dental Arches and its Treatment."

Discussion by Lloyd S. Lourie, Chicago, Ill.; Herbert A. Pullen, Buffalo, N. Y.; S. H. Guilford, Philadelphia, Pa.; F. S. McKay, Colorado Springs, Colo., and Victor H. Jackson, New York city.

Section II.

J. V. Conzett, Dubuque, Iowa: "The Gold Inlay from the Standpoint of a Gold Filling Enthusiast."

Discussion by W. H. Taggart, Chicago, Ill.; Don M. Gallie, Chicago, Ill.; J. Q. Byram, Indianapolis, Ind.; Chas. W. Rodgers, Dorchester, Mass., and J. F. Wallace, Canton, Mo.

Charles Channing Allen, Kansas City, Mo.: "Professional Opportunity."

Discussion by Wm. Carr, New York city; Thos. J. Barrett, Worcester, Mass.; V. E. Turner, Raleigh, N. C.; Chas. E. Jones, Chicago, Ill., and J. J. Wright, Milwaukee, Wis.

David Stern, Cincinnati, Ohio: "The Metric System of Weights and Measures."

Discussion by Wilbur F. Litch, Philadelphia, Pa.; John P. Buckley, Chicago, Ill.; Emory A. Bryant, Washington, D. C., and Edwin N. Kent, Brookline, Mass.

James G. Sharp, San Francisco, Cal.: "Some of Our Difficulties and How to Correct Them."

Discussion by B. Holly Smith, Baltimore, Md.; A. J. Cottrell, Knoxville, Tenn.; J. Edward Chace, Ocala, Fla.; R. Boyd Bogle, Nashville, Tenn., and George R. Warner, Grand Junction, Colo.

M. Evangeline Jordan, Los Angeles, Cal.: "Preventative Dentistry for Children."

Discussion by W. T. Jackman, Cleveland, Ohio; Ray D. Robinson, Los Angeles, Cal.; Arthur C. Watson, Denver, Colo.; Garrett Newkirk, Pasadena, Cal., and Celia Rich, Nashville, Tenn.

Section III.

John P. Buckley, Chicago, Ill.: "The Importance of a Correct Diagnosis Before the Therapeutics of Diseases of the Dental Pulp."

Discussion by Edward C. Kirk, Philadelphia, Pa.; A. H. Peck, Chicago, Ill.; F. G. Worthley, Kansas City, Mo.; John R. Callahan, Cincinnati, Ohio, and Frank L. Platt, San Francisco, Cal.

G. V. I. Brown, Milwaukee, Wis.: "Stomatitis."

Discussion by J. D. Patterson, Kansas City, Mo.; L. G. Noel, Nashville, Tenn.; G. V. Black, Chicago, Ill.; W. H. DeFord, Des Moines, Iowa, and Thomas Edward Carmody, Denver, Colo.

Martin Dewey, Kansas City, Mo.: "A Study of the Temporo-Mandibular, Articulation, Cusp, and Approximal Contact Points."

Discussion by A. H. Thompson, Topeka, Kans.; W. Bebb, Los Angeles, Cal.; W. E. Walker, New Orleans, La.; F. C. Kemple, New York city; L. P. Bethel, Columbus, Ohio, and H. A. Fynn, Denver, Colo.

Herbert L. Wheeler, New York city: "A Review of the Dental Hygiene Movement, with Suggestions for Increasing its Efficiency."

Discussion by Paul G. White, Boston, Mass.; Edward Everett Haverstick, St. Louis, Mo.; J. D. Towner, Memphis, Tenn., and W. A. White, Phelps, N. Y.

Wednesday, 8 p.m., July 20th.

Open session devoted to Oral Hygiene.

Address—"The Teeth and Health in their Public Relations." By W. A. Evans, M.D., Commissioner of Health, Chicago, Ill.

The headquarters of the Association will be at the Brown Palace Hotel. Rate: Rooms without bath, $2.00 per day; with bath, $2.50 and $3.00 per day. See official program for information regarding other hotels, etc.

All sessions of the Association, clinics, and exhibits will be held in the Auditorium.

Tourists' railway rates are the best we are able to secure. Special train leaves Chicago over the Northwestern at 6 p.m., Saturday, July 16th.

Burton Lee Thorpe, *President*,
St. Louis, Mo.
Chas. S. Butler, *Rec. Sec'y*,
Buffalo, N. Y.

N. D. A. Clinics.

One of the special features of the clinic to be held in Denver will be the surgical section. Several dental surgeons have consented to give clinics that will be of unusual interest. Arrangements for clinics are ideal.

Dr. A. W. Starbuck, College of Dental Surgery, Denver, Colo., is chairman of the Local Clinic Committee. All clinicians will please write him and let him know the kind of case needed, and find out what they need to take with them. For all chair clinics, cabinets will be furnished, so that the clinician may have a place in which to put his instruments.

We solicit clinics from any member of a state or district society, and if you have not already sent in your name and your subject, do so at once, to any one of the committee.

F. O. Hetrick, *Chairman*, Ottawa, Kans.

[At Denver.]

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The twenty-eighth annual session of the National Association of Dental Examiners will be held at the new Savoy Hotel, Denver, Colo., commencing Monday, July 25, 1910, at 10 a.m. The rates will be $2.00 per day for one and $3.00 per day for two persons in room, European plan; large room for one or two with private bath $4.00 and $5.00 per day. Meeting and committee rooms at the service of the association, free, and every accommodation extended.

An early mail reservation is requested, the time being the busy season. A full repre-

sentation from every state in the United States is earnestly desired.

J. J. WRIGHT, *President*,
Wells bldg., Milwaukee, Wis.
CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

[AT DENVER.]

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE National Association of Dental Faculties will meet at the Hotel Shirley, Denver, Colo., Monday, July 25, at 10 o'clock A.M. The Executive Committee will meet to consider business of the association at 9 o'clock A.M. on the same day.

The Hotel Shirley is connected by bridge with the Savoy, where the meeting of the National Association of Dental Examiners takes place on the same date.

The rates will be $2.00 per day for one and $3.00 for two persons in one room, European plan. Large rooms for one or two persons with private bath, $4.00 and $5.00.

B. HOLLY SMITH, *Ch'man Ex. Com.*,
Baltimore, Md.

[AT DENVER.]

DENTAL FACULTIES ASSOCIATION OF AMERICAN UNIVERSITIES.

THE annual meeting of the Dental Faculties Association of American Universities will be held in Denver, Colorado, at the time of the annual meeting of the National Dental Association. Opening meeting, Monday, July 18th, at 9 A.M.

J. G. SHARP, *President*,
EDWARD C. KIRK, *Secretary-treasurer*.

[AT DENVER.]

DELTA SIGMA DELTA FRATERNITY.

THE twenty-sixth annual meeting of the Supreme Chapter of Delta Sigma Delta Fraternity will convene at the Hotel Savoy, Denver, Colo., Monday, July 18th, at 10 A.M.

R. HAMILL D. SWING, *Supreme Scribe*.

FLORIDA STATE DENTAL SOCIETY.

THE Florida State Dental Society will meet at St. Augustine, Fla., June 23d to 25th.

W. A. DEAN, *Corresponding Sec'y*,
Tampa, Fla.

GEORGIA STATE DENTAL SOCIETY.

THE forty-fourth annual meeting of the Georgia State Dental Society will be held in Atlanta, Ga., June 14, 15, and 16, 1910.

DELOS L. HILL, *Sec'y*,
Atlanta, Ga.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

THE thirteenth annual meeting of the Southern California Dental Association will convene June 16, 17, and 18, 1910, at the College of Dentistry, University of Southern California, Fifth and Wall sts., Los Angeles. Visiting dentists are cordially invited.

This is the first of the coast meetings, and is followed by the California State Dental Association at San Francisco, the Oregon Association at Portland, and the Washington Association at Seattle.

These meetings convene at intervals of a few days, the series being completed in time to reach Denver for the National Dental Association.

B. FRANK GRAY,
Ch'man Publicity Com.

AMERICAN MEDICAL ASSOCIATION.

SECTION ON STOMATOLOGY.

FOLLOWING is the program of the American Medical Association, Section on Stomatology, for the annual session at St. Louis, Mo., June 7 to 10, 1910:

1. Chairman's Address. Thomas L. Gilmer, Chicago.

2. "Growth and Regeneration of the Bones of the Face." Stewart L. McCurdy, Pittsburg. Pa.

3. "The Surgical Principles of Hare-lip Operations." George V. I. Brown, Milwaukee, Wis.

4. "A Study of the Repair of Cementum." M. H. Fletcher, Cincinnati, Ohio.

5. "Systemic Conditions in Relation to Oral Symptoms: Pain, Fetor, and Sepsis." Vida A. Latham, Chicago.

6. "The Teeth as a Factor in Pathogenesis." Herbert A. Potts, Chicago.

7. "Septicemia of Dental Origin." Arthur R. Dray, Philadelphia, Pa.

8. "The Mouth Lesions of Syphilis and the Dangers Arising from Them." Charles M. Whitney, Boston, Mass.

9. "The Relation of Pathologic Conditions of the Mouth and Systemic Diseases." Henry R. Harrower, Chicago.

10. "The Value of Vaccines in Oral Surgery." James E. Power, Providence, R. I.

11. "The Teeth and Alveolar Processes as Points of Entrance for the Tubercle Bacillus." Frederick Moorehead, Chicago.

12. "The Close Relations between the Dentist and the Physician." Bertha E. Bush, Chicago.

13. "A Review of the References to Oral Conditions in a Number of Standard Textbooks on Surgery." Arthur D. Black, Chicago.

14. "Conservation of General Health in Children through Overcoming the Inclination toward Nasal Stenosis by Means of Widening the Maxillary Arch." Nelson Black, Milwaukee, Wis.

15. "The Influence of Widening the Palatal Arch on the Nose." Lee Wallace Dean, Iowa City, Iowa.

16. "The Relation of the Teeth to the Development of the Face." Fred. Noyes, Chicago.

17. "How Shall the Stomatologist be Educated?" Eugene S. Talbot, Chicago.

18. "Future Stomatological Education." M. L. Rhein, New York city, N. Y.

THOMAS L. GILMER, *Chairman*,
EUGENE S. TALBOT, *Sec'y*.

CANADIAN DENTAL ASSOCIATION.

THE bi-annual meeting of the National Dental Association of Canada will be held in Toronto, May 31, June 1, 2, and 3, 1910,—papers and clinics. We invite our American brethren, and offer them all the privileges of the convention. Delightful temperature in June. Toronto is three hours from Buffalo, four from Muskoka or Georgian Bay, one night from the famous Cobalt, and six hours from the Thousand Islands of the St. Lawrence. Come and join us. Single-fare rates, upon certificate plan, over all of trunk-line territory.

GEO. W. GRIEVE, *Sec'y Ex. Com.*,
2 Bloor st., East Toronto, April 7, 1910.

MICHIGAN STATE DENTAL SOCIETY.

THE next annual meeting of the Michigan State Dental Society will be held in Detroit, Mich., June 13, 14, and 15, 1910.

DON M. GRAHAM, *Sec'y*,
Detroit, Mich.

SOUTH DAKOTA STATE DENTAL SOCIETY.

THE annual meeting of the South Dakota State Dental Society will be held at Pierre, S. D., June 9 and 10, 1910. All reputable practitioners are cordially invited.

E. J. SCHNAIDT, *Sec'y*,
Menno, S. D.

MASSACHUSETTS DENTAL SOCIETY.

THE forty-sixth annual meeting of the Massachusetts Dental Society will be held at Springfield, Mass., Tuesday, Wednesday, and Thursday, June 14, 15, and 16, 1910. The members and guests of the society will enjoy the scientific and literary program usual in dental society meetings. Special features will be papers by Drs. Cook and Buckley of Chicago and Dr. Price of Cleveland, with others to be announced. A limited number of high-grade clinics on timely subjects are scheduled.

An interesting and instructive manufacturers' exhibit is scheduled which will give the dentist an opportunity to keep abreast of the times in the equipment and supplies which are an essential in the expression of the dentist's personality. The complete program which will be mailed to each member will give the details of the meeting.

Come to Springfield on some of these rare days in June, and see the City of Homes in all its beauty, nestled down in the gorgeous valley of New England's Rhine. There you will find a city of 85,000 and a purchasing center for over half a million.

Forest Park, our pleasure park, has an area of over seven hundred acres. The Springfield rifle is made here, also the Smith & Wesson revolver.

A part of the meeting will be held on Mt. Tom, from the summit of which one can get a complete panoramic view of the surrounding country and see for twenty or thirty miles up and down the river.

A feature of the meeting will be the Ladies' Day. Wednesday afternoon we go to Mt. Tom by trolley and have our dinner at the summit, and papers afterward.

Wide-awake dentists need scarcely be told that the most successful men are those who gather inspiration from the fellowship of kindred spirits of their professions. Those in charge of this meeting are planning to lay special emphasis on the social features of the meeting. We extend to the dental profession a most cordial invitation to join with us in the pleasure and inspiration of this meeting in the beautiful city of Springfield.

It is planned to hold the annual meetings in different parts of the state from year to year, thereby giving an opportunity to the dentist and his family to become acquainted with the different parts of the state and their dentists. It is believed that mutual acquaintance among people and dentists is the first step toward a mutual respect and appreciation.

C. Edson Abbott, *Editor*,
Franklin, Mass.
Charles W. Rodgers, *Sec'y*,
165 Harvard st., Dorchester, Mass.

NORTHERN OHIO DENTAL ASSOCIATION.

The fifty-third annual meeting of the Northern Ohio Dental Association will be held in Toledo, at Hotel Secor, June 7, 8, and 9, 1910.

It is a good time now to plan for this meeting. Excellent papers, fine exhibits, A 1 clinics, and a rare meeting-place.

C. F. Woodbury, *Ch'man Ex. Committee*,
Cleveland, Ohio.

CALIFORNIA STATE DENTAL ASSOCIATION.

Change of Date of Meeting.

The thirty-seventh annual meeting of the California State Dental Association will be held in San Francisco, June 22 to 25, 1910. An interesting program of papers and clinics is being arranged, and it will be one of the most instructive meetings ever held on the coast. Eastern friends are invited to attend on their way to Denver.

C. E. Post, *Sec'y*,
San Francisco, Cal.

MAINE DENTAL SOCIETY.

The next meeting of the Maine Dental Society will be held June 23 to 25, 1910, at the Rangeley Lake House, Rangeley, Me.

I. E. Pendleton, *Sec'y*.

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

The sixteenth annual meeting of the Southern Wisconsin Dental Association will be held at Janesville, Wis., June 2 and 3, 1910.

C. W. Collver, *Sec'y*,
Clinton, Wis.

SOUTH CAROLINA STATE DENTAL SOCIETY.

The South Carolina State Dental Society will hold its fortieth annual meeting at Glenn Springs (near Spartanburg), S. C., beginning June 28 and adjourning July 1, 1910. An attractive program will be presented.

Ethical practitioners of dentistry residing in the state of South Carolina who may desire to join the society are requested to send their names and addresses to

W. Busey Simmons, *Sec'y*,
Piedmont, S. C.

MARYLAND STATE DENTAL ASSOCIATION AND DISTRICT OF COLUMBIA DENTAL SOCIETY.

A joint meeting of the District of Columbia Dental Society and the Maryland State Dental Association will be held in Baltimore, at the Dental Department of the Baltimore Medical College, June 9, 10, and 11, 1910.

A cordial invitation is extended to all ethical members of the profession to attend and participate. Exhibitors requiring space are requested to communicate with Dr. Geo. R. Carter, 712 N. Eutaw st., Baltimore, Md.

For further particulars address

H. M. Schooley,
1110 F st., Washington, D. C.
F. F. Drew,
701 N. Howard st., Baltimore, Md.

PENNSYLVANIA STATE DENTAL SOCIETY.

The Pennsylvania State Dental Society will hold its next annual meeting in the Board of Trade Building, 112-116 Market st., Harrisburg, June 28, 29, and 30, 1910.

Luther M. Weaver, *Recording Sec'y*,
Philadelphia, Pa.

UNIVERSITY OF ILLINOIS COLLEGE OF DENTISTRY.

Alumni Association.

The Alumni Association of the College of Dentistry, University of Illinois, will hold their third annual clinic and meeting on Wednesday, June 1, 1910, in the college building, corner Harrison and Honore sts., Chicago. It will be a strictly alumni clinic, but ethical members of the profession are invited to be present.

Frank J. Ryan, *Sec'y*.

NORTH CAROLINA STATE DENTAL SOCIETY.

The thirty-sixth annual meeting of the North Carolina State Dental Society will be held July 13 to 16, 1910, at Wrightsville, N. C. The Seashore Hotel will be the headquarters.

Arthur H. Fleming, *Sec'y*,
Louisburg, N. C.

NEW JERSEY STATE DENTAL SOCIETY.

The fortieth annual meeting of the New Jersey State Dental Society will convene in Asbury Park, N. J., at the Casino, July 20, 21, 22, and 23, 1910. This is to be the largest meeting ever held; two days will be devoted to different and interesting clinics, which should not be missed. Many fine and instructive papers to be read. The Hotel Columbia will be the headquarters of the society.

Asbury Park is ideal for the meetings of the society, with its ocean frontage, large and cool. The entire floor of the Casino is to be leveled for the exhibits, which will be many and varied, and everything new will be shown.

Asbury Park can be readily reached by rail, boat, or motor, and will be a good resort for the visitors to bring their families, who will find the hotels large and commodious and the entertainment of a high class, while they attend the meetings. No one can afford to miss this meeting. Prospective members, ethical practitioners of other states, and members of local societies are cordially invited.

For further information address

Charles A. Meeker, *Sec'y*,
29 Fulton st., Newark, N. J.

NEW MEXICO DENTAL SOCIETY.

The New Mexico Dental Society will hold its third annual session at Las Vegas, New Mex., July 16 to 18, 1910. On the afternoon of July 18th the society will leave for Denver in a body, to attend the National Dental association.

Chas. A. Eller, *Sec'y*,
Albuquerque, N. M.

WISCONSIN STATE DENTAL SOCIETY.

The fortieth annual meeting of the Wisconsin State Dental Society will be held at Ashland, Wis., July 12, 13, 14, and 15, 1910.

Harvey N. Jackson, *President*,
Milwaukee, Wis.
M. L. Christensen, *Sec'y*,
Oshkosh, Wis.

VIRGINIA STATE DENTAL ASSOCIATION.

Change of Date of Meeting.

The forty-first annual session of the Virginia State Dental Association will be held at Staunton, Va., August 3, 4, and 5, 1910. The change of date is made on account of the meeting in July of the National Dental Association.

Every effort is being made to make this the most interesting and successful meeting of our society. Men of national reputation will give clinics and read papers. All ethical practitioners are cordially invited to attend.

For exhibit space, rates, etc., address the manager of the Virginia Hotel, Staunton, Va.

W. H. Pearson, *Cor. Sec'y*,
Hampton, Va.
J. W. Manning, *Ch'm Ex. Com.*,
Norfolk, Va.

DENTAL BOARD OF NEW SOUTH WALES.

Following is the *personnel* of the second appointed Dental Board of New South Wales:

President—Donald Smith, Esq.

Ex-officio members—Professor Anderson Stuart, Dr. E. R. Magnus.

Dental members—Dr. A. Burne, Dr. P. Ash, Mr. A. W. Cleary.

Medical members—Dr. Maitland Gledden, Dr. J. J. Kelly.

Registrar—Horace Taylor.

Horace Taylor, *Registrar.*

KANSAS BOARD OF EXAMINERS.

The next meeting of the board for the examination of candidates for license to practice dentistry in Kansas will be held in Topeka, Kans., beginning June 21, 1910, at 9 a.m. Only graduates of reputable dental schools, or those having practiced five years in some other state or territory, are eligible. Of those from states having reciprocal agreement with Kansas, only the practical examination is required.

For further information and blanks, address

G. F. Ambrose, *President*,
Eldorado, Kans.
F. O. Hetrick, *Sec'y*,
Ottawa, Kans.

ILLINOIS BOARD OF EXAMINERS.

The semi-annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for license to practice dentistry in Illinois will be held in Chicago, at the Northwestern University Dental School, corner Lake and Dearborn sts., beginning Monday, June 13, 1910, at 9 a.m.

The following preliminary qualifications shall be required of candidates to entitle them to examination by this board for license to practice dentistry in the state of Illinois: Graduates of a reputable dental or medical school or college, or dental department of a reputable university, who enter the school or college as freshmen on or after the school year 1906-07, must have a minimum preliminary education of not less than graduation from an accredited high school or a certificate from the state superintendent of public instruction, equivalent officer or deputy, acting within his proper or legal jurisdiction, showing that the applicant had an education equal to that obtained in an accredited high school; which certificate shall be accepted in lieu of a high-school diploma.

Candidates will be furnished with proper blanks and such other information as is necessary on application to the secretary. All applications must be filed with the secretary five days prior to date of examination. The examination fee is twenty dollars, with an additional fee of five dollars for a license.

Address all communications to

T. A. Broadbent, *Sec'y*,
705 Venetian Bldg., Chicago, Ill.

SOUTH CAROLINA BOARD OF EXAMINERS.

The next meeting for the examination of applicants for license will be held at Glenn Springs, near Spartanburg, S. C., on June 24 to 28, 1910. All applicants must register with the secretary on the 24th.

For further information address

B. Rutledge, *Sec'y*,
Florence, S. C.

WEST VIRGINIA BOARD OF EXAMINERS.

The West Virginia State Board of Examiners will hold a meeting at Wheeling, W. Va., June 8, 9, and 10, 1910. Applicants for examination must file their applications, together with the fee of twenty-five dollars.

For blanks and other information address

J. Fleetwood Butts, *Sec'y*,
Charleston, W. Va.

NEBRASKA DENTAL BOARD.

The regular meeting of the Nebraska Dental Board for the examination of applicants for license to practice dentistry in Nebraska will be held in Lincoln, at the State-house, beginning Monday, June 27, 1910, at 9 a.m. All applications must be in the hands of the secretary by June 20th. For application blanks and other information address

H. C. Brock, *Sec'y*,
North Platte, Nebr.

RHODE ISLAND BOARD OF REGISTRATION.

THE Rhode Island Board of Registration in Dentistry will meet for the examination of candidates at the State-house, Providence, R. I., Tuesday, Wednesday, and Thursday, June 28, 29, and 30, 1910. Application blanks and particulars may be obtained from

H. L. GRANT, *Sec'y*,
1025 Banigan Bldg., Providence, R. I.

OHIO DENTAL BOARD.

THE Ohio State Dental Board will hold its regular spring meeting in Columbus on June 21st to 23d, inclusive. All persons desiring to secure licenses at this time should write the secretary for blank application and return same, with the fee of twenty-five dollars, not later than June 11th.

For further information address

L. L. YONKER, *Sec'y*,
Bowling Green, Ohio.

MICHIGAN BOARD OF EXAMINERS.

THE next regular meeting of the Michigan State Board of Dental Examiners for the examination of applicants for registration will be held at Ann Arbor, Mich., beginning Monday, June 20th, and continuing until the 25th. Applications must be in the hands of the secretary at least fourteen days before the examination, and should be addressed to

A. W. HAIDLE, *Sec'y*,
Negaunee, Mich.

WISCONSIN BOARD OF EXAMINERS.

THE Wisconsin State Board of Dental Examiners will hold a meeting for the purpose of examining applicants for license to practice dentistry, beginning June 20, 1910, in the Dental Department of the Marquette University, Milwaukee, Wis. All applications, together with a fee of $25, must be in the hands of the secretary fifteen days before the examination.

For further information address

C. S. MCINDOE, *Sec'y*,
Rhinelander, Wis.

PENNSYLVANIA BOARD OF EXAMINERS.

THE next regular meeting of the Pennsylvania State Board of Dental Examiners will be held on June 8, 9, 10, and 11, 1910, in Musical Fund Hall, Philadelphia, and in the Pittsburg Dental College, Pittsburg. For further information address Department of Public Instruction, Harrisburg, or

G. W. KLUMP, *Sec'y*,
Williamsport, Pa.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE next meeting of the New Hampshire Board of Registration in Dentistry for examinations will be held at Masonic Banquet Hall, Manchester, N. H., June 1, 2, and 3, 1910.

No special examinations. All persons must become registered before beginning practice.

A. J. SAWYER, *Sec'y*,
Manchester, N. H.

CONNECTICUT DENTAL COMMISSIONERS.

THE Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Thursday, Friday, and Saturday, June 16, 17, and 18, 1910, to examine applicants for license to practice dentistry. Application blanks, rules, etc., will be forwarded by the recorder upon request.

By order of the Commission,

GILBERT M. GRISWOLD, *Recorder*,
783 Main st., Hartford, Conn.

ARKANSAS BOARD OF EXAMINERS.

THE next meeting of the Arkansas State Board of Dental Examiners will be held June 6th and 7th, in Little Rock.

All applicants are required to pass an examination, making a general average of 75 per cent.; with or without diploma. The examination covers all branches taught in the dental schools, and is theoretical only; no temporary license, no special examination. Fee fifteen dollars.

A. T. MCMILLIN, *Sec'y*,
Little Rock, Ark.

VIRGINIA BOARD OF EXAMINERS.

THE regular annual meeting of the Virginia State Board of Dental Examiners will be held in Richmond, Va., the second Tuesday in June 1910.

For further information address

J. P. STIFF, *Sec'y*,
Fredericksburg, Va.

IOWA BOARD OF EXAMINERS.

THE Iowa State Board of Dental Examiners will hold a meeting for the examination of candidates for license to practice dentistry in Iowa, beginning June 6, 1910, at 9 A.M., at Iowa City.

For blanks and other information write

E. D. BROWER, *Sec'y*,
Le Mars, Iowa.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS.

THE Board of Dental Examiners for the District of Columbia will hold the spring examinations June 20, 21, and 22, 1910, at the George Washington University, Dental Department.

Applications must be in the hands of the secretary by June 15th.

CHAS. W. CUTHBERTSON, *Sec'y*,
309 Seventh st., N. W., Washington, D. C.

MINNESOTA BOARD OF EXAMINERS.

THE next regular meeting of the Minnesota State Board of Dental Examiners will be held at the dental department of the State University, in Minneapolis, June 6, 7, 8, and 9, 1910.

All applications must be in the hands of the secretary ten days before. All applicants must be graduates and must present their diploma. Those having practiced in any of the following states for five years or more will be exempt from the theoretical examination: Iowa, Indiana, Michigan, Nebraska, Wisconsin, or Montana. Minnesota dentists are admitted to those states on same conditions. For blanks and further information apply to

GEO. S. TODD, *Sec'y*,
Lake City, Minn.

INDIANA BOARD OF EXAMINERS.

THE next meeting of the Indiana State Board of Dental Examiners will be held in the Capitol, Indianapolis, beginning Monday, June 13, 1910, and continuing four days. All applicants for registration in the state will be examined at this time.

No other meeting will be held until January 1911.

For further information apply to

F. R. HENSHAW, *Sec'y*,
507-8 Pythian Bldg., Indianapolis.

TEXAS BOARD OF EXAMINERS.

THE regular meeting of the Texas State Board of Dental Examiners will be held in Houston, Texas, beginning 9 A.M. Monday, June 13, 1910. Diplomas not recognized or registered; examination required of all. No interchange of license with any other state. No special examination for practitioners already in active practice. Applications, accompanied by a fee of twenty-five dollars, should be in the secretary's hands by June 10th.

For further information address

BUSH JONES, *Sec'y*,
Dallas, Texas.

FLORIDA BOARD OF EXAMINERS.

THE next annual meeting of the Florida State Board of Dental Examiners will be held in St. Augustine, June 21, 22, and 23, 1910.

Applicants for license to practice dentistry in this state will be required to exhibit diploma from reputable dental colleges, and take examination, both theoretical and practical. The practical will be one gold filling and one amalgam filling in the mouth, one dowel crown to be made and mounted, one upper and lower set of teeth to be set up and articulated. Board will furnish models, also head-rests and blowpipes. Applicant must furnish other necessary instruments, also recent photograph with application. Examination fee $20.00, certificate $5.00.

No interchange of license with any state. Any further information furnished on application.

W. G. MASON, *Sec'y*.

MASSACHUSETTS BOARD OF REGISTRATION.

A MEETING of the Massachusetts Board of Registration in Dentistry, for the examination of candidates, will be held in Boston, Mass., June 1, 2, and 3, 1910.

Application blanks may be obtained from

G. E. MITCHELL, *Sec'y*,
25 Merrimack st., Haverhill, Mass.

WYOMING BOARD OF EXAMINERS.

THE Wyoming State Board will meet to hold examinations on July 5, 6, and 7, 1910, at the Senate Chamber, Cheyenne, Wyo. All applications must be in the hands of the secretary twenty days before the examinations. For further particulars address

PETER APPEL, JR., *Sec'y*,
Cheyenne, Wyo.

MONTANA BOARD OF EXAMINERS.

THE next meeting of the Montana State Board of Dental Examiners will be held at Harmony Hall, Helena, July 11, 12, and 13, 1910, or until the work is completed. All applicants must have their papers filled out and in the hands of the secretary at least ten days prior to the meeting. Patients will be furnished by the board, also engines, vulcanizers, etc. Applicants must furnish their own material, instruments, etc. For further information, blanks, etc., address

D. J. WAIT, *Sec'y*,
Helena, Mont.

NORTH CAROLINA BOARD OF EXAMINERS.

THE next annual meeting of the North Carolina State Board of Dental Examiners will be held at Wrightsville, N. C., commencing on July 11, 1910. All applications for examinations must be accompanied with a diploma from a reputable dental school, which must be filed with the secretary by 9 A.M. on the first day of the meeting.

For requirements and further information address

F. L. HUNT, *Sec'y*,
Asheville, N. C.

MAINE BOARD OF EXAMINERS.

THE Maine State Board of Dental Examiners will meet in Portland, Me., July 5, 1910, for the examination of applicants for license to practice dentistry.

For information address

E. C. BRYANT, *Sec'y*,
Pittsfield, Maine.

VERMONT BOARD OF EXAMINERS.

A MEETING of the Vermont Board of Dental Examiners for the examination of candidates will be held at Montpelier, Vt., July 5, 6, and 7, 1910, commencing at 2 P.M., at the State-house.

For further information, rules, and blanks apply to

J. HOLMES JACKSON,
Burlington, Vt.

SOUTH DAKOTA BOARD OF EXAMINERS.

THE South Dakota State Board of Dental Examiners will hold its next regular meeting at Sioux Falls, S. D., July 6, 1910, beginning at 9 A.M., and continuing three days. All applications for examination, together with a fee of twenty-five dollars, must be in the hands of the secretary by June 26th. Applicants who have not complied with the above will not be permitted to take the examination.

G. W. COLLINS, *Sec'y*,
Vermillion, S. D.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the Assembly chamber of the State-house at Trenton, N. J., July 5, 6, and 7, 1910. Practical work on the 5th, and the theoretical examination the 6th and 7th. All applications must be in the hands of the secretary ten days prior to the meeting. Applicants must send preliminary credentials and photograph with the application, or it will not be accepted.

Sessions begin promptly at 8 A.M. each day.

CHAS. A. MEEKER, D.D.S., *Sec'y*,
29 Fulton st., Newark, N. J.

DENTAL INDEX BUREAU

UNDER THE AUSPICES OF THE

NATIONAL ASSOCIATION OF DENTAL PEDAGOGICS.

[See page 629 *et seq.* and page 680 *et seq.* of present issue of the DENTAL COSMOS.]

A PLAN BY WHICH SUBSCRIBERS WILL BE FURNISHED A CLASSIFIED CARD INDEX OF ARTICLES IN THE LEADING DENTAL JOURNALS.

At a meeting of the National Institute of Dental Pedagogics, held in St. Louis last December, a committee was appointed to establish a Dental Index Bureau. Briefly stated, it is intended that this committee shall employ a competent person to review and classify all of the articles in ten or twelve of our leading dental journals, and shall furnish to each of the subscribers to the Bureau, at frequent intervals, cards so classified and grouped that the subscriber may easily and quickly find all the articles on any subject in dentistry. These cards will be made on definite system, by which additional cards may be added as they are received and always go to their proper places; so that no matter how many additions may be made from year to year, all of the cards on each subject will be in a separate group. For example, all of the articles on the subject of filling teeth with gold will be in one group, all on filling teeth with amalgam in another, all on cavity preparation in another, all on alveolar abscess in another, etc.

It is hardly necessary to mention the value of such an index to the wide-awake members of the profession. Journals which may have accumulated, and which are now almost worthless on account of the difficulty in finding articles when desired, will become of service as the index is extended to cover them. The man who has occasion to look up a particular subject, or to write a paper, can find all that has been written on that subject instantly. The grouping of articles on each subject enables one to bring together the views of many writers. Post-graduate courses of study can be instituted by dental societies or undertaken by individuals; the ready reference index will make college libraries of the greatest value to the faculty and to the student body; editors and writers will find their work facilitated, and the results of their study more gratifying to themselves and more highly appreciated by their readers.

The idea of the committee is to organize a permanent society for the purpose of classifying and indexing all dental literature. The present plan is but preliminary to the greater work, which will cost less and less to individual subscribers as the number of members is increased. Those who help to start the work will profit more than those who follow, and will have the satisfaction of participating in one of the greatest advance movements in dentistry.

The subject-matter of several of the leading dental journals has already been classified and indexed by Dr. Arthur D. Black, at a great expenditure of time and money. This index contains about 40,000 cards, cataloging articles in various journals from 1839 to date; but it is not available, for obvious reasons, to the profession at large. Your committee is privileged to copy these cards, should the funds subscribed permit, which would be of great benefit to the subscribers and incidentally to the whole profession.

It is the committee's intention to this year furnish each subscriber with author and subject cards for all original articles, papers read before societies, book reviews, and editorials, in about ten journals for 1908 and 1909—from 4000 to 5000 cards, all properly arranged with all cards for each subject together, with guide cards for each subject and with author cards arranged alphabetically. It is expected that in 1910 the cards will be furnished for the same journals for the years 1907 and 1910; and in 1911 cards for 1906 and 1911. Thus in three years each subscriber will receive cards for these journals for six years—probably 25,000 to 30,000 cards. These cards will be sent in boxes in which they may be kept permanently. The number of journals indexed and the number of cards sent out by the committee, however, will depend upon the number of subscribers.

The preliminary report of this committee, which was made at the St. Louis meeting, gives an outline of the plan. It will be noticed that it is the intention to try this plan for a period of three years, and subscriptions at the rate of Twenty-five Dollars ($25.00) a year for that period may be sent to any member of the committee.

Subscriptions will be received from individuals, dental journals, dental schools, or dental societies. Any person or group of persons may send in a single subscription, and one set of cards will be sent in return. Subscription blanks may be had from any member of the committee.

Committee for 1910—Dr. W. L. Fickes, *Chairman*, 6200 Penn ave., Pittsburg, Pa.; Dr. Arthur D. Black, 31 Washington st., Chicago, Ill.; Dr. Herman Prinz, 603 Century Bldg., St. Louis, Mo.

ARMY DENTAL CORPS.

Memorandum of changes of station and duties of dental surgeons, U. S. army, for the week ending April 30, 1910:

R. H. Mills, April 21st, reports return to Ft. Adams, R. I., from temporary duty at Ft. Ethan Allen, Vt.

George H. Casaday, April 16th, ordered to proceed from Presidio of Monterey, Cal., to Fort Rosecrans, Cal., for temporary duty.

R. M. Hollingsworth, April 22d, reports on two months' leave from date.

John S. Marshall, April 23d, relieved from duty in the Philippines Division, and will proceed on the transport to sail from Manila, P. I., about October 13, 1910, to San Francisco, Cal., for further orders.

John A. McAlister, Jr., April 23d, relieved from duty in the Philippines Division, and will proceed on the transport to sail from Manila, P. I., about December 15, 1910, to San Francisco, Cal., for further orders.

Robert H. Mills, April 27th, granted twenty days leave of absence.

George I. Gunckel, April 15th, ordered to Ft. Barrancas, Fla., for temporary duty for the period of six weeks.

For the week ending May 7th:

George D. Graham, April 29th, reported for duty at Fort Des Moines, Iowa, left Fort Omaha, Neb., on April 28th.

George H. Casaday, April 26th, reported for duty at Fort Rosecrans, left Presidio of Monterey, Cal., on April 25th.

George L. Mason, left station on May 2d, on ten days leave of absence.

Franklin F. Wing, April 20th, reported for duty at Fort D. A. Russell, Wyo.

Minot E. Scott, April 21st, ordered to proceed to several posts in the Department of the Columbia, for temporary duty.

Robert H. Mills, May 5th, left Fort Adams, R. I., on twenty days leave of absence.

For the week ending May 14th:

George L. Mason, May 9th, the leave of absence heretofore granted is extended two months and twenty days.

For the week ending May 21st:

Charles J. Long, May 13th, ordered to Fort Adams, Rhode Island, for duty.

George I. Gunckel, May 17th, reports for temporary duty at Fort Barrancas, Florida.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING APRIL 1910.

April 5.

No. 953,702, to Edward P. Off. Artificial tooth.

April 19.

No. 955,143, to Thomas Dunbar. Dental lavatory.

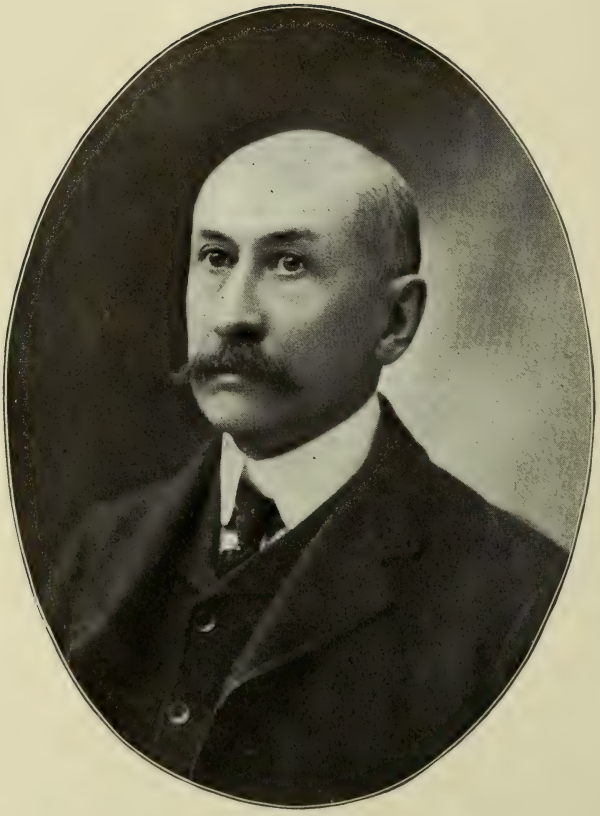
No. 955,320, to Agnes D. Cloud. Dentimeter.

No. 955,484, to J. V. Trenaman. Electric dental engine.

April 26.

No. 956,218, to Julius Steinbrugge. Tooth-regulator.

No. 956,368, to Alfred Koch. Plate punch.



DR. CHARLES H. DARBY.

THE

DENTAL COSMOS.

VOL. LII. JULY 1910. No. 7.

ORIGINAL COMMUNICATIONS.

A CONSIDERATION OF THE QUESTION OF SUSCEPTIBILITY AND IMMUNITY TO DENTAL CARIES.

By EDWARD C. KIRK, D.D.S., Sc.D., Philadelphia, Pa.

(Read before the First District Dental Society of the State of New York, February 8, 1910.)

OUR present knowledge of dental caries has been achieved by a series of fairly well defined stages, each approaching a step nearer to the truth as one after another fragment of the composite whole has been translated from the unknown into terms of the known.

Observation of the clinical features of the carious process early gave rise to two opposing schools of belief respecting its origin and nature—one based upon the conception that dental caries arose from within the structure of the tooth, that it was gangrenous in character, and therefore an inflammatory process; the other, that dental caries was a chemical or chemico-vital process originating in the surroundings of the tooth and proceeding from without inward.

It is difficult to determine which of these two theories is the more ancient, as traces of both are to be found in the earliest medical writings upon the subject; both maintained their vogue with a gradually increasing belief in the chemico-parasitic theory until the scientific researches of a group of men culminating in the work of Miller demonstrated the truth of that theory, in 1883, and made it possible to assert the axiom that "Decay of the teeth is a factor of the environment of the teeth."

Miller's demonstration, brilliant as it was, in that it solved a problem which for ages had engaged the attention of students, was but one of a series of equally important discoveries in the problem of disease causation made possible by the new methods of bacteriological research devised and introduced by Professor Koch of Berlin, with whom Miller worked in his laboratory.

The revelation of the important relation which micro-organisms bear to disease causation resulting from the work of Tyndall, Pasteur, and others, and demonstrated by the discoveries of Koch and his followers, served to concentrate the attention of both the professional and the layman upon means for the elimination of micro-organisms as disease-producing factors; hence, under the impulse of this

dominating idea arose the era of antiseptics—of war upon the germ by means of chemical and other agencies having germ-destroying properties. Experience in the war of germ extermination soon developed certain important facts; first, that chemical antiseptics having sufficient dynamic intensity to destroy germ life exerted their devitalizing power in much the same way and to practically the same degree upon living tissue cells, and therefore, safer means for combating disease-producing organisms when in contact with living tissue must be sought for. The pendulum of research then swung from antisepsis to asepsis as the means of prophylaxis in surgical and obstetrical practice. During the course of this evolutional development of thought in its attitude toward the problems of bacterio-pathology, attention became directed to the natural defensive forces of the organism against bacterial invasion. As a natural phenomenon it had long been observed that certain individuals were less susceptible to attacks of infectious disease than were others. It was also known that certain diseases were self-protective in character, *i.e.* that when an individual had passed through one attack he was not liable to a repetition of the disorder when again subjected to similar sources of infection; hence the conclusion that immunity to certain kinds of infection was of two types, a natural immunity and an acquired immunity.

It will thus be seen that investigation of the general problem of disease causation has been characterized by two distinctly marked phases—first, that concerned with the study of the active agents, the *materies morbi* of disease causation; second, investigation of our means of defense against the attacks of these agents. It is upon the correct understanding of the exact nature of these two aspects of the general question that our ability to successfully combat disease must depend; and this applies not only to the treatment of disease already established, but to the larger problem of disease-prevention or prophylaxis.

THE QUEST FOR THE CAUSES OF SUSCEPTIBILITY AND IMMUNITY TO DENTAL CARIES.

Because of its intimate relation to medical science and art, the evolution of our views with respect to special dental disorders has taken place along lines in all respects parallel with those which I have briefly indicated as characterizing the development of scientific medicine. We have recognized dental caries as a germ disease; we have endeavored to combat it by the means of antisepsis and of asepsis. We have recognized that the disorder, while it is well-nigh universal in its infectiousness, still fails to produce its ravages in the mouths of a noticeable minority of the human race. We have also noted that dental caries is markedly a disease of youth, also that in many instances it tends to disappear or to recur in the same individual; in short, that dental caries, like many other diseases of germ origin, is modified in its expression by the factor of susceptibility and immunity in the individual. It is to this latter factor that I desire to particularly invite your attention.

Besides the fact of the periodicity of tooth decay, also the fact that while many, indeed most, individuals suffer from its effects in greater or less degree at some period of life, the further observation has been made that wounds of the soft tissues of the oral cavity ordinarily heal with less inflammatory reaction than wounds of the cutaneous surface, notwithstanding the now well-known fact that the mouth is a breeding-place for a variety of micro-organisms a considerable number of which are known to be pathogenic. These facts, and the commonly observed habit of licking their wounds which is universal among the lower animals, have served to create the belief that the saliva possesses antiseptic properties, and that it is the presence or absence in that fluid of some as yet undiscovered antiseptic agent which will ultimately explain the phenomena of susceptibility or immunity to dental caries.

That the saliva should contain antiseptic agencies seems untenable upon *a priori* grounds, for, as Miller has stated regarding this point—"The idea that human saliva may have an antiseptic action in respect to the bacteria habitually found in the mouth itself seems to me utterly untenable. It is about as reasonable as it would be to constantly reiterate that grass is a poison for cattle, knowing at the same time that cattle flourish exceedingly well in a good meadow. We know that a considerable number of bacteria which we designate as the oral flora are constantly found in the human mouth. As often as they are removed mechanically, by brushing or in the process of mastication, they rapidly form again, and there is no doubt that they find a very favorable culture medium in the fluids of the mouth. Notwithstanding the knowledge of these facts, there are many who still maintain that those fluids are poison for such bacteria."

Regardless of his *a priori* belief in the non-existence of a bactericidal element in the human saliva, Miller, with his characteristic love of scientific exactitude and for the purpose of arriving at the truth of the matter by means of experimental research, undertook and carried out an elaborate series of studies which led him to the definite conclusion that the saliva as such, whether from those immune or those susceptible to dental caries, contained no substance which was inimical to the growth of oral bacteria. His research included among other things the study of potassium sulfocyanid as a possible germicidal factor of the saliva, and his conclusion was that it did not interfere with bacterial growth in any strength less than five times as great as the maximum amount found in the normal saliva.

Miller's results confirmed the previous finding of Hugenschmidt, who had worked upon the same thesis in Metchnikoff's laboratory, and also showed the untrustworthy character of the conclusions of Sanarelli and Florian, both of whom had attributed direct antiseptic powers to the saliva.

The work of Arthur Hugenschmidt, published in 1896 (Dental Cosmos, vol. xxxviii, page 797), seems to me sufficiently convincing both as to the general question of the supposed antiseptic qualities of the saliva and the supposed antiseptic power of potassium sulfocyanid. The fact that wounds of the soft tissues of the oral cavity heal so promptly without infection he was able to satisfactorily explain upon the basis of the positive chemiotactic properties of the saliva produced by the excreta of the oral flora, which induced a pronounced leucocytosis in the wounded surface, thus protecting it against bacterial infection.

The publication of the exhaustive research of Miller in 1903, as it seems to me, has placed the matter beyond the possibility of further question by reducing it to a demonstration that the saliva does not possess any antiseptic properties at all, thus confirming what we had, upon general principles, good reason to suspect.

That the question of the possible antiseptic value of potassium sulfocyanid as a prophylactic treatment against dental caries is still receiving serious consideration can, I think, only be attributed to a lack of knowledge of the nature and meaning of the study of that question by Miller and by Hugenschmidt as well. The majority of students of the subject are in accord as to the correctness of Miller's conclusions, or, as expressed by G. V. Black in answer to the inquiry of the Correspondent of the Dental Society of the State of New York as to whether "The normal salivary secretion has any inherent antiseptic quality": "All that is necessary from me is an emphatic No." (Dental Cosmos, vol. l, December 1908, p. 1423.)

Holding to the same view, my consideration of the problem of susceptibility and immunity to dental caries eliminates the possible antiseptic power of the saliva as a factor, and necessitates an explanation of the conditions upon other grounds.

SOME FACTS THAT ARE WELL ESTABLISHED.

Certain facts with regard to dental caries are well established; for example,

we know that the disease, while it is well-nigh universal, is more prevalent in the early stages of existence than it is in adult life and thereafter; it is essentially a disease of childhood—otherwise stated, youth is a period of susceptibility to dental caries, which changes to a condition of immunity as maturity is reached. It is also known that dental caries is a factor of tooth environment, and consequently that neither the form, structure, nor function of the teeth operate as causative factors in the production of dental caries, as both Black and Williams have demonstrated. It is known that caries is not essentially a filth disease, for while it is perhaps true that ideally clean teeth do not decay, it is equally true in many cases that teeth which are unspeakably unclean also do not decay. We also know the intimate nature of the process of dental caries to the extent that its bacterio-pathology has been demonstrated by the researches of Miller, which show that tooth-decay is the result of the activities of certain bacterial ferments acting upon carbohydrate pabulum in such a way as to convert it into lactic acid, which decalcifies the hard structures of the tooth, exposing its organic matrix, this in its turn being liquefied and further decomposed by other bacterial agencies capable of causing putrefactive decomposition.

It is further known that caries is selective in its attacks, not only as to the individual but also with respect to the areas of tooth structure involved in a given case—upon the practical recognition of which fact our whole system of technique in cavity preparation depends. It is known also, as the result of investigation particularly by Miller and Black, that lactic acid ferment germs exist in the mouths of caries immunes to practically the same degree that they are found in the mouths of those who are susceptible to caries.

Such being the case, and in the absence of any known defensive agencies either in the teeth themselves or in the oral fluids surrounding the teeth, an explanation of the observed factors of immunity and of susceptibility to dental caries must be sought for in some other direction.

NEGLECT OF CERTAIN ASPECTS OF THE SUBJECT.

I have in various communications endeavored to direct attention to the consideration of certain aspects of this important question which I feel have not been studied to the extent that their significance, all things considered, appears to warrant. In view of the fact that we know that caries is a germ disorder dependent upon the activities of a specific type of bacterial organism, it is important to keep constantly in view the fact that the conditions necessary for the growth of these organisms and the development of their vital activities upon which the carious process depends, are defined within certain clearly recognized limitations, and that modifications in conditions requisite for their growth tend to inhibit their vital activities or render their development altogether impossible.

It has been shown with caries-producing organisms, as with practically all pathogenic bacteria, that they are extremely sensitive to environmental changes. Successful cultivation upon artificial media is only possible where the exact kind and amount of pabulum needed by the bacterium has been ascertained, and its demands as to temperature, moisture, oxygen, and the reaction and composition of the culture medium have been accurately supplied. Bacteria of decay which flourish actively in the saliva of caries susceptibles show a reduced activity for some hours when transplanted to artificial culture media, but regain their intensity of action when they have become adjusted to their new habitat, while any fundamental change in the composition of their normal food supply prevents the possibility of their growth. For the growth of caries-producing bacteria we know that besides the physical conditions of temperature and moisture afforded by the oral cavity, they require carbohydrate food of such composition that under the influence of the bacterial ferment it can be directly split

up into lactic acid as an end-product. This supply of necessary pabulum we know is furnished by the sugars derived from the hydrolysis of starch through the diastasic influence of the salivary ferment ptyalin. Whether the starch is taken as food and the sugars derived therefrom constitute the only source of pabulum for the development of the bacteria of caries is an open question as yet, for the researches of Michaels and others tend to show that the saliva of susceptibles contains in solution as part of its composition a fermentable carbohydrate, glycogen, which may also serve as a pabulum for caries-producing bacteria quite apart from that directly derived from carbohydrate food débris, in which case the presence of such a carbohydrate in the saliva as a nutritional product would go far to explain the greater susceptibility of certain individuals upon diathetic or nutritional grounds.

The investigations of Michaels, amply confirmed by others, have brought out the fact that the saliva is by no means stable or uniform in composition as among various individuals, or at different periods in the same individual. It is because of this variability in the salivary composition that the importance of the saliva as an index of the general nutritional state of the individual has come to be recognized.

Furthermore, when we take into consideration the sensitiveness of bacteria toward alterations in the culture medium, it cannot be doubted that the changes in salivary composition due to variations in the nutritional state of the individual must exert a profound influence upon the activity of bacterial growth in the human mouth as between different individuals or at different times in the same individual. It is this view of the question which I believe promises the greatest hope for a solution of the problem of susceptibility and immunity to dental caries.

SUSCEPTIBILITY AND IMMUNITY AS RELATED TO AND VARYING WITH THE NUTRITIONAL STATUS.

We have noted that dental caries is essentially a disease of childhood and youth; and when we come to study the question of food habit in youth and maturity respectively, we find, generally speaking, that the consumption of carbohydrates is relatively greater in youth than at maturity and thereafter. Childhood is the starch and sugar-eating period. Beginning at the weaning stage, the infant is fed upon paps of sweetened starch, fermentable infant foods, potato, biscuits, cakes, etc., with a relatively small proportion of proteid in the dietary. The candy-eating stage is reached as early as the convertibility of the penny into the product of the candy-shop is solved by the infant mind as an economic problem, and once established is rarely relinquished until years of so-called discretion have been attained. In the meantime decay has done its devastating work in the denture. With early adult life the tendency of the food habit is to change toward the proteid side, and with this change in food habit the arrest of carious action and ushering-in of the stage of immunity occurs. For several years I have made it a point to examine into the question of food habit in cases of both susceptibility and immunity to dental caries, and I have found a practically uniform and constant relation of these two conditions to the carbohydrate and the proteid food habit respectively. Caries is rarely to be found in a state of active progress in the mouth of a meat-eater. I regard, then, the absence or insufficiency of carbohydrate material in the salivary composition as one of the important, if not most important, factors in immunity to dental caries—for lack of proper pabulum is fully as efficient as a prophylactic as is antisepsis or asepsis.

REACTION OF THE ORAL FLUIDS.

Another potent factor in its bearing upon the problem of susceptibility and immunity to caries is the reaction of the oral fluids. In the present state of our knowledge it is difficult to say with certainty what is the normal reaction of the mixed oral fluids, especially if by the term normal we imply an ideal standard of health with all of the nutritive processes in perfect equilibrium. The mixed saliva is the combined product secreted

by several pairs of special salivary glands which pour their secretion into the buccal cavity; in addition to this it contains the mucoid secretion of a multitude of mucous glands embedded at various points beneath the mucous membrane of the mouth. While a neutral or slightly alkaline reaction may be taken as normal to a healthy saliva, it is certain that where the saliva is mucoid in character, is viscid because it holds much mucin in solution, such a saliva is always alkaline in reaction, for the reason that mucin is precipitated by acids and by acid salts, consequently an acid saliva within certain limits is free of mucin, limpid, and of thin consistence. My own observation of many cases as they are examined at our college clinic leads me to the conclusion that the most active expression of caries is to be found in mouths having an alkaline and highly mucoid saliva, and that such saliva is characteristic of the starch and sugar-eater. We rarely find active caries in mouths having a thin, limpid saliva of acid reaction, which is more characteristic of the arthritic—the individual whose oxidation processes are inferior to normal, and who does not burn up his proteids to their normal end-products.

The importance of the salivary reaction is twofold with reference to carious susceptibility or immunity; first, in relation to the vital conditions of bacterial growth, and second, in relation to the localization of the decay process. With regard to the first point, various observers agree that lactic fermentation proceeds best in a neutral medium, and Miller's direct investigation of that point demonstrated the fact that when the accumulated lactic acid reached 0.75 per cent. the fermentation process was promptly arrested by the death of the bacterial organism in its own waste product; hence the necessity for some neutralizing agent in the surrounding medium if the fermentation process is to be kept continuously active. In the carious process it has been taken for granted that the calcium salts of the surrounding tooth structure neutralize the lactic acid as it is excreted by the bacterial ferment. I question the validity of this view, for the reason that I am not able to understand how tri-calcium phosphate can neutralize lactic acid without creating an acid end-product, and for the still further reason that when I have added coarsely powdered tooth structure in excess to a one per cent. solution of lactic acid it has remained continuously acid for over two months and until an accidental mold infection brought about decomposition of the specimen. Neutralization or removal of the lactic acid of caries is, I am inclined to believe, brought about by carbonates in the saliva or by its simple solvent or washing effect, by which the acid of the caries is carried away as such by the surrounding medium.

The sources of oral acidity are two. First, acidity resulting from fermentative action in the buccal cavity; second, that due to the formation of acid salts the result of faulty nutritional processes. These latter are distilled out from the blood through the oral mucous glands, and thus find their way into the mixed saliva. When the acidity from either cause reaches a certain maximum the mucin is precipitated and the saliva loses its ropy character, becoming thin and limpid, or the excretion of mucin may be arrested in the mucous glands, in which instance we have a limpid, often neutral or amphoteric saliva, with an acid reaction of various localized areas over the buccal mucous membrane. When these areas of acidity occur in various parts of the buccal mucous membrane, we have, I believe, a precipitation of the mucin of the mucus at those points, and in that fact we may find an explanation of certain types of irritation of the buccal mucous membrane that are characterized by catarrhal conditions, particularly in the naso-pharynx, associated with deposits of adherent thickened excretion which is really mucin precipitated by the acid salts excreted in these localized areas of the membrane. The mucous membrane becomes irritated not only by the mucin precipitated in the glands embedded in its texture, but by the constant coughing and hawking occasioned by the effort to dislodge it. In the same way we may account for the

hypertrophied condition of the buccal mucous glands so frequently observed in the texture of the labial mucous membrane in those individuals suffering from chemical erosion of the front teeth.

MUCIN IN RELATION TO THE BACTERIAL PLAQUE.

The relationship of mucin to the carious process I believe to be a most important one. The researches of Black, of Williams, and of Miller have shown conclusively the existence of a bacterial film or envelope growing most vigorously upon protected areas of tooth structure, which growth we have come to know as the bacterial or "gelatinous" plaque. Decalcification of enamel structure subjacent to the plaque or film has also been clearly demonstrated, leaving no room for doubt as to the fact that in susceptible mouths these plaque formations are the agency by which localization, or at least one kind of localization, of the decay process is brought about. On the other hand it is abundantly proved that the film or plaque exists upon teeth immune to caries, in which cases acid decalcification does not take place in the enamel beneath the plaque. The explanation of the existence of the plaque minus acid decalcification should not be difficult to find, when we consider on the one hand that decay is a specific process requiring in its simplest expression only the factors of lactic-acid-producing bacteria, a suitable pabulum, the usual physical conditions, and contact with tooth structure, while with any one of these lacking the decay cannot occur; and on the other hand, the fact that plaque formations undoubtedly differ in character as they are produced by bacteria other than those which are exciters of decay, and grow upon media other than that necessary to the sustenance of the lactic-acid-producing group of micro-organisms. Black's original report of his study of this phase of the subject is sufficiently clear as to the variety of conditions under which plaque formation may take place. I have elsewhere called attention to one possible mode of plaque formation which I regard as important in connection with the carious process—especially so because it helps to explain a number of obscure points in connection with the problem of susceptibility and immunity. (*Dental Brief,* March 1910, vol. xv, p. 175.)

If to a few cubic centimeters of saliva in a test tube we add a drop or two of lactic acid in almost any degree of concentration, the contact of the acid with the saliva, if the latter holds mucin in solution, will cause precipitation of the mucin as a coagulum or film which spreads out through the liquid and increases in consistence as it falls to the bottom of the tube. So delicate is the reaction that mucin furnishes a very sensitive though not characteristic indicator for the presence of lactic acid and *vice versa.*

Joseph Head, in the report of his experiments with highly diluted acids in their effect upon enamel, states that so extreme an attenuation of lactic acid as one part in twenty thousand of water will visibly etch enamel in the course of some hours, but that the addition of saliva prevents the destructive action, and that the saliva therefore exerts a protective influence against the destructive effect of dilute acids upon the enamel. (Dental Cosmos, vol. xlix, p. 801, *et seq.*). Such protective action on the part of the saliva in the instance cited is in all probability due to the action of mucin, which if present in sufficient quantity clears the saliva of acid in the same way that the acid clears the saliva of mucin, *i.e.* by precipitation as an acid-mucin coagulum. From our knowledge of the behavior of mucin toward lactic acid in the mass we are justified in prognosticating its mode of behavior toward lactic acid in the nascent state—the chemical principles in both cases being the same.

Assuming, then, a lactic acid bacterium temporarily fallen upon a protected area of tooth structure in a culture medium capable of supporting its vital activity, and containing besides glucose a certain amount of mucin—all of which conditions are to be found in the saliva of the ordinary caries susceptible—fer-

mentation of the glucose is at once set up, each molecule of the sugar being split up into two molecules of lactic acid which is shed out into the surrounding medium, causing an immediate precipitation of mucin about the bacterial growth, which adheres to the tooth surface by virtue of the precipitated mucin acting as the binding material of the agglutinated mass. It is in this manner, I believe, that localization of decay in protected areas originates in susceptible cases. The subject is at present under investigation in my laboratory, and I regret that the work is not yet sufficiently advanced for me to make a report of the experimental tests at this time. Two other features, however, lead me to regard this explanation as being correct for at least one type of plaque or film formation: First, the similarity of the iodin test reaction as observed in plaques upon the teeth and the reaction to iodin of precipitated mucin; second, the solubility of plaques in lime-water. Dr. C. E. Kells of New Orleans has persistently recommended lime-water as a detersive wash for removing slimy deposits upon the teeth. In view of the probable fact that these film-like deposits have a base of precipitated mucin, and as lime-water is the best solvent for mucin, Dr. Kells' recommendation of lime-water as a tooth-wash has a perfectly rational basis. I have found by experience that the detersive and cleansing qualities of the lime-water are enhanced by the addition of twenty to twenty-five per cent. of hydrogen dioxid.

In asking your consideration of the mucinous origin of the bacterial plaque it is not my intention to overlook the fact that various other methods of plaque formation are quite possible, as has been clearly pointed out by G. V. Black, Kenneth W. Goadby, and others. In studying the general question it seemed to me that the precipitation of mucin among the lactic-acid-producing bacteria was a factor of plaque formation that ought not to be overlooked, because it furnishes a more direct and obvious explanation of that phenomenon than some of the suggestions already offered in this connection. I have read with much interest the report upon this phase of the subject made by the Research Committee of the Dental Society of the State of New York at its last annual meeting (Dental Cosmos, February 1910, vol. lii, p. 170), and I have wondered whether with respect to plaque formation the committee had studied Black's communications on the subject, or if with respect to potassium sulfocyanid they had studied Miller's and Hugenschmidt's researches, which taken together cover the same ground, and to repeat which work would seem to be an unnecessary expenditure of effort unless it was desired to cross-test the work of these preceding investigators.

SUMMARY.

To gather up the essential points in this rather desultory presentation of the subject, it seems clear that the conditions which determine the factor of susceptibility or of immunity to dental caries are those which determine the composition of the mixed oral fluids which we call the saliva. In the absence of a bactericidal element in the saliva, which fact may be regarded as proved, I think we are justified in our present state of knowledge in viewing immunity to carious action as being dependent upon the absence from the saliva of the kind and amount of pabulum upon which the bacteria of decay normally thrive. As one of the important, and I believe the direct means of localization of the decay process in caries susceptibles, the precipitation of mucin by the secreted lactic acid appears to be a prominent factor.

Finally, as the composition of the saliva upon which caries depends is a factor of nutrition dependent upon food habit, decay of the teeth is a diathetic expression, and the desired immunity to its ravages can be attained only through attention to more intelligent and rational dietetic hygiene.

In placing the subject before you in this manner I wish it to be understood that my desire has been mainly to direct your attention to an old subject from a different angle of view, and with no intention of doing so in a dogmatic way, but rather in the hope that you may find

a suggestiveness in this view which will in the course of time and through accumulation of individual observations enable us to deal more effectively with this devastating and well-nigh universal disease of the human teeth.

NOTE.—Since the above was written the experimental production of the bacterial plaque has been successfully accomplished in the laboratory by inoculating with caries fungi a pabulum consisting of glucose and salivary mucin made alkaline with dibasic sodium phosphate, the whole colored with blue litmus. Precipitation of all the mucin as a large plaque took place by action of the acid resulting from the fermentation, and the final reaction of the medium became acid, as shown by the reddening of the dissolved litmus extract.

A PROPOSED APPLICATION OF COMPRESSED ANTISEPTIC GASES TO OPERATIVE DENTISTRY.

By R. MACDONALD, D.D.S.Univ.Pa., Leicester, England.

IT has occurred to the author that it may be possible to bring about the direct application of suitable compressed antiseptic gases in the sterilizing of canals after arsenical applications, in pericementitis, in alveolar abscess, in antrum disease, and in bleaching. The antiseptic properties of oxygen, ozone, chlorin, and formaldehyd gases is of course recognized, but hitherto their application has been made through the medium of liquid chemical solutions of which they formed a part.

The direct application of suitable antiseptic gases to a septic canal, to an abscess tract, or to the antrum, would in our belief be attended by immediate results.

The author therefore begs to suggest that small steel cylinders about 12 inches in length capable of being fastened underneath the Holmes or the Allan bracket table, be designed, with a very fine screw adjustment for controlling the exit of the gas; these cylinders to be charged with compressed oxygen, ozone, chlorin, or formaldehyd, mixed with air.

A fine rubber tubing would connect the exit nozzle of the cylinder with the handpiece; at the end of the handpiece would be inserted something in the nature of a long hypodermic needle, having a number of lateral openings in addition to the ordinary opening at its end. This needle would be constructed so as to be of sufficient fineness to pass into an ordinary canal. While the method proposed lends itself to all teeth, it is particularly the conservative treatment of the centrals, laterals, and canines that we have in view.

As to the method or operation of sterilizing septic canals, after the canal has been entered and nerve broaches have been used, the fine screw adjustment valve of the small cylinder of compressed antiseptic gas is opened, the gas flowing through the rubber tubing to the handpiece, where it flows through the needle; this needle is then inserted into the canal, which would thus be subjected to the germicidal and antiseptic action of the gas.

If it is desired to force the gas through the apical foramen and along the tract of an alveolar abscess discharging through an external fistula, it would be necessary to have a little rubber cone fitting around the shoulder of the needle where it enters the tooth, this rubber cone by gentle pressure making a gas-tight joint at its entrance to the tooth. Thus the whole tract of an abscess could be subjected to the antiseptic and germicidal action of any desired gas.

For sterilizing the antrum, a very fine long tube with slight bulbous formation at the end would be used, this bulbous

portion being laterally perforated, so as to allow the flow of the antiseptic gas in all directions; this antrum tube would be grooved longitudinally, so as to afford a return means of escape, not only to the foul air in the antrum but also to the excess of antiseptic gas used during the operation. The necessity for thorough sterilization of the canals, even after removal of the devitalized pulp is evident, because in ordinary exposure of the pulp there is invariably accompanying infection, and cultures made will frequently show us cocci, bacilli, and spirochætes.

The well-known effects of sodium dioxid, pyrozone, and hydrogen dioxid, indicate the unquestioned antiseptic power of oxygen gas, and formalin, of course, owes its peculiarly subtle properties to the formaldehyd.

Some of the compressed antiseptic gases which are suggested here, such as chlorin and formaldehyd, could be diluted with atmospheric air to any desired percentage before being compressed.

Clinical experience would determine whether it was expedient to dehydrate the canal or have it moistened while applying the compressed antiseptic gases.

This mode of using compressed gases would, in my opinion, lend itself to the operation of bleaching, as chlorin and oxygen are the main active principles in all bleaching solutions. The apical foramen having been closed by cement or gutta-percha, the canal would be filled with the bleaching gas, *i.e.* oxygen or chlorin, and sealed for some time.

The needles used for insertion into septic canals would unscrew from the handpiece, and thus permit of the complete sterilization of their outer surface by boiling.

THE CARE OF THE TEETH OF CHILDREN: OUR DUTY TO THE MEN AND WOMEN OF THE FUTURE.

By THOMAS E. WEEKS, D.D.S.,
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(Read before the Connecticut State Dental Association at its annual meeting, April 19, 1910, at New Haven, Conn.)

GOD in his wisdom imposed the law that every individual owes something to his fellows; ethics is based upon this law, and man suffers from disobedience. In assuming some callings in life man increases his obligations. He who essays to minister to the mental, spiritual, or physical well-being of his fellows enters this class and assumes the added obligations.

THE DENTIST'S DUTY.

We as dentists undertake to minister to one kind of physical ills, and if we wish to maintain the position that our calling is a branch of the healing art, we must be ready and willing to discharge the obligations of the physician. In the very nature of things the physician must be a teacher as well as a healer.

Having been born as a profession not so long ago, we undertook the care of the mouth and teeth; at least, I am convinced that the great and good men who founded our profession intended that as the scope of dentistry. Scan the history of dentistry and answer as to how nearly we have fulfilled these intentions. We believe that we are growing ever nearer to this ideal, so we will pass over our omissions, remembering them only as they may help us to improve.

ENLIGHTENMENT OF THE PUBLIC.

Assuming that the dentist *is* competent to advise and direct those who seek his

aid, and is able to treat the lesions of the mouth and teeth, he finds himself in the midst of a collection of individuals of whom only one-fifth or less ever employ the services of a dentist. What of the great majority? They are either too poor or too ignorant, or both, to be able to understand their own needs or to relieve them. Here then is our opportunity—first to teach, then to discharge some of the obligations we assumed when we accepted our diploma, which gave us the right to say to the world, We are competent to discover and cure all the ills of your mouth and teeth. Are we, all of us? If not, are we striving to learn, or are we satisfied to go on doing the same old things we learned (or thought we did) at college?

This is not a sermon, but some thoughts seemed to array themselves as a basis for some practical suggestions which we will now endeavor to present. While the title indicates two separate divisions, the one is so dependent upon the other that when speaking of the one we cannot ignore the other. As the care of the teeth of children *is* the discharge of our duty to the men and women of the future, we will consider the duty first, then how best to discharge it.

It is the consensus of opinion that the education of the people can best be accomplished by teaching the children, so we are beginning to learn how to do this and how to help these children to have and maintain clean healthy mouths. The medical profession has already accomplished something in the education of and the service to the children of the public schools. This service has undoubtedly been a factor in causing them to recognize that diseases of the mouth and teeth are quite as important and worthy of attention as any other disability. This recognition on the part of the doctors of medicine renders our task easier, but it also cuts out our work for us.

ALREADY ESTABLISHED DENTAL INFIRMARIES.

If we look over the efforts that have already been made, we will find that the most successful ones are those where a number of dentists banded together gave money, time, and service for the establishing and maintaining of free infirmaries for the care of the teeth of the deserving poor. When we demonstrate that we are willing to give, first of money according to our ability, then of a certain proportion of our time, in personally serving those who have need of our services but are too poor to afford it, then there will appear those who will be willing to assist in enlarging the work.

It was my privilege to visit the Free Dental Infirmary at Reading, Pa., which is almost ideal in its realization of the obligations that we owe the children. Here all or nearly all of those in the city who have any moral right to call themselves dentists are pledged to the cause, and give freely one-half day each month in personal service to those who have a right to such service, in an infirmary which is a model of equipment, cleanliness, and conduct. This was made possible through the co-operation of many in the community, who were encouraged, by observation of the initial effort of the dentists themselves, to come to their support.

It is unnecessary to review in detail the mental and physical impairment resulting from defective teeth and unwholesome mouths. It is sufficient to note the fact, and agree that it is someone's duty to see that the mouths of all the children in each community are looked after, that they may be clean, with dental organs in a condition to perform their function in the nourishment of the child, that he or she may grow to vigorous and useful manhood or womanhood.

ADVANTAGES FOR THE DENTAL PROFESSION.

That there is a general awakening of the profession all over the world is apparent, and wherever dentists have united in an unselfish effort, working together without thought of self-advancement or returns of any kind except that satisfaction which comes from increasing the

comfort and happiness of another, the greatest results have been obtained.

We may preach all we please without inducing our wealthy neighbor to loosen his purse-strings, but let us do something, and as soon as we begin to produce results he will take notice, and ask for an opportunity to share in the work and assist in broadening and perfecting the service. If all the dentists of every town and city in the land would get together, regardless of society, fraternal, or religious affiliations, and agree to rent and equip a room in which they would each serve one or two half-days each month, there would undoubtedly be enough broad-minded people of ability to help in a material way, who would come forward and insure the success of the enterprise.

Brothers of the Connecticut State Dental Society, get busy; get together, and get the unaffiliated men together, and *do it.* If you will, I predict the greatest advancement in dentistry in this state ever known anywhere. "In union there is strength"; this is one of the truest words you know. It requires a common cause to bring men together. We have the cause, and wherever men have come together it is noticeable that petty differences of opinion have vanished. On one occasion I tried my best, without avail, to bring two friends together who had become estranged. What I failed to accomplish has resulted from a common interest in this movement for the education and service of the school children, and now they are working together shoulder to shoulder in a common cause. God bless the cause!

This is one of the inevitable results of service in a common cause, and if this public-service movement should result in nothing more than uniting the dental profession, it would be enough—but this is not all that it will accomplish. Working together as men must in these infirmaries will result in an interchange of ideas and a development of methods more nearly in harmony. Then what possibilities there will be for statistical research! If impressions were taken of the dentures of every child presenting for treatment, models made, and all data such as age, nationality, physical characteristics, etc., recorded on suitable blanks, what a wealth of material would be provided for the clearing up of many mooted points! Records of other mouth conditions might also be secured which could not fail to be useful to the investigator. Indeed, the possibilities for education are almost limitless, and will have such a reflex that the dentists themselves will derive quite as much benefit from the service as those whom they serve.

FIRST STEPS TOWARD ESTABLISHING A DENTAL INFIRMARY.

Recognition of the need of this education and service has existed in the minds of the majority for some time, but in only a few localities has it crystallized into action until quite recently. Many state and local societies, as well as the national body, have begun to move in this matter, but I am confident that we shall fail in anything like a perfect realization of our ideals if we confine the movement within the membership of our societies. We have been accused of exclusiveness in our organizations. We can refute this in no more effective manner than by giving every man practicing dentistry in our community an opportunity to do his part in this work. In places where a local society exists, a committee could be appointed to start the movement. Let them select the best man in the place who is not affiliated with the society to co-operate with them in securing the support of all the rest of the non-members. Where no society exists, a committee could be formed by one man going to his most promising colleague (sometimes called competitor) and securing his pledge to give some money and some time each month, also to aid in securing the interest and co-operation of all the other men in town. These two could select a third, and the committee would be formed. The work of such a committee would be to get every dentist in town to agree to pay his *pro rata* share of the expense necessary to provide a suitable dental equipment. This equip-

ment need not be very elaborate in the beginning; second-hand chairs, engines, etc., can always be purchased at a small cost, and almost everyone has some instruments that can be spared, so that an operating equipment sufficient for a start could be provided at a small expense.

All this is possible in every town where there are from eight to twelve dentists. When this start has been made, it is more than probable that enough public-spirited citizens will be found to rent and complete the furnishing of a room and provide for its maintainence, including the services of a competent lady secretary to act as assistant and attend to the clerical work. Where this plan is not possible at once, the dentists composing the corps might each set apart one or two half-days each month for the service of deserving children in their own offices, until public interest has been sufficiently awakened to make a public infirmary a possibility. It is unnecessary to go further into details. These will work out, once the movement is started and all the dentists are working together as one man. Simultaneously with this movement efforts should be made to interest those engaged in educational and charitable work, that opportunity may be secured for giving the necessary instruction in the public schools, and that provision may be made against the abuse of the privileges of the infirmary by those able to pay for dental services. Here again the details will develop to suit the conditions existing in each community. Only *get to work,* and be not discouraged if success does not come at once. Honest purpose, with industry, will win. "Keep moving."

THE TREATMENT OF THE CHILDREN.

With the infirmary a fact, the next problem that confronts us is how best to reach and serve those whom we desire to benefit. Here a few suggestions for the handling of children and the treatment of carious teeth in their mouths, based on long experience in private and infirmary practice, where many children were treated, may be in order.

First, it is absolutely necessary that we gain the confidence of the child. This is not always an easy task, especially if the parents have threatened the child with a visit to the dentist as a punishment for some offense, which is sometimes thoughtlessly done. Adults are almost always to blame when the child regards the dentist with fear; so many seem to delight in magnifying their suffering from dental operations. When this is done in the presence of children it seldom fails to impress them unfavorably. I remember one middle-aged gentleman, an attorney, who invariably slept through the major portion of every operation, but who always entertained any acquaintance who might be in the waiting-room when he left the chair with a graphic account of his sufferings. On several occasions there were children present; then he would direct his story and his sympathy to them. Children seldom have fear of us unless it has been instilled into them by their elders, and sympathy usually increases our difficulties. For this reason I try to have them come alone, and under no condition will I permit the mother or father to stand beside the chair.

Most children are willing to be shown, and a little patience and tact combined with honesty will usually succeed. If you can impress the child at the first sitting that you have accomplished something without inflicting pain, you have gone far in gaining his or her confidence.

Never deceive a child. If you promise them not to hurt, keep your promise even if you fail to accomplish all you desired. If some pain is unavoidable, wait until some degree of confidence is established, then tell them so, and ask their co-operation, promising to desist at their request. If they *know* that you will keep your promise and obey such requests, they will feel that *they* are masters of the situation, and their pride will induce them to bear such discomfort as they know is unavoidable.

The experience of most of us has been with children coming from families having some appreciation of the importance of sound teeth, and it is quite a different

proposition when we come to deal with children who come from homes where the only idea of a dentist is that he "pulls teeth," "hurts dreadfully," and is a thing to be avoided. This makes it all the more necessary that we avoid inflicting pain in the beginning.

METHODS AND MATERIALS FOR PRESERVING CHILDREN'S TEETH.

Let us look into the matter closely and see how nearly we agree on methods and materials used in conserving the teeth of children. If we make freedom from pain the object of paramount importance in our service to children, as I believe we should, can we satisfy our ideals as to the character of the operation?

Gold has been our standard of excellence in filling materials, and those high in authority have told us that children's teeth are as capable of sustaining and retaining a metallic filling as those of adults. Many of us have filled the teeth of very young children with gold, or when the parents were unable to afford gold, we have used amalgam, to satisfy our conception of excellence and permanence. The indestructibility and integrity of the material employed in filling a tooth is not the only factor that determines the permanence of the operation. Time will not permit a full consideration of this subject, but we may mention some of the causes of failure when gold or amalgam is used in children's teeth.

CAUSES OF FAILURE OF GOLD AND AMALGAN FILLINGS IN CHILDREN'S TEETH.

First, let us consider the condition in case of failures, aside from those cases where the filling is lost in bulk owing to insufficient anchorage. Without considering the cause or reason for recurrent caries around or beneath a filling, whether it be due to faulty preparation, failure to sterilize infected dentin, faulty insertion of the material, or failure to extend the cavity margins into immune areas, the condition is practically the same, *i.e.* the filling is *in situ,* with more or less destruction of enamel and dentin around or beneath the filling. The very presence of the filling affords protection to the destructive organisms.

We do not deny that a gold or amalgam filling *can* be made even in the teeth of very young children, so that it will remain and fulfil its office permanently, but is it always wise to do it?

INDICATIONS FOR PERMANENT OR TEMPORARY FILLINGS.

Much has been written on the subject of "humane dentistry," and if we are to establish and maintain a good mental attitude on the part of children toward us we *must* be humane. Let us remember that our whole duty to children has not been discharged when we have filled the cavity perfectly. Let us get away from the idea that we must in every case attempt a so-called "permanent" filling. There are some conditions which contraindicate it; let us not ignore them. Because of conditions beyond our control, materials considered as temporary often make the most permanent operations in children's teeth.

AN INADVISABLE METHOD OF FILLING.

Take a not unusual case. A child of eight presents with the first permanent lower molar showing a mesio-occlusal cavity so far progressed that when it is opened and the *softened* dentin is removed, the pulp is covered with only a thin layer of dentin, which is undoubtedly infected. There are still those practitioners who, to satisfy their ideas, flood the cavity with creasote, phenol, or some similar drug, fill the deeper portion of the cavity with zinc oxyphosphate, and complete the filling with amalgam; all this at one sitting, or at best after sealing in some anodyne dressing for a day or two. In order to do this thoroughly the application of the rubber dam is required, as is also more or less cutting of dentin and enamel to provide proper anchorage for the filling and to place the margins of the cavity in safe areas, and further, the final finishing and polishing

of the amalgam. The average operator would require from forty-five minutes to an hour to do this as it should be done. To consider anything short of the most thorough technique would be an insult to this body.

If the operator who proceeds in the way described above would stop to consider the minute anatomy, physiology, pathology of the tooth, and the possible changes that may take place in the pulp under such treatment, he would seek, first, a substance for the filling of the deeper portion of the cavity which would be sedative to the pulp, render the infected dentin aseptic, and protect the pulp from thermal changes. Do phenol and zinc oxyphosphate fulfil these requisites? Second, he would seek a material for the remainder of the filling which could be inserted easily, and which would protect the walls of the cavity from recurrent caries, even though it may need occasional restoration of contour in order to maintain proper contact with the adjoining tooth. Both he and the little patient would be less fatigued if such a procedure could be performed in half the time, beside avoiding the use of the rubber dam.

SUGGESTIONS FOR A RAPID FILLING METHOD.

Let us now present another picture of the same case, giving the outlines of the technique, so that it may stand out more clearly.

The unsupported enamel is cut away with sharp chisels. The softened dentin is removed with a pair of right and left spoon excavators, that must be very sharp and as large as the cavity will permit. The cavity is then ready for the filling without further shaping. Mix some iodoformagen cement rather stiff, and set it aside until all other preparations are complete. Then mix some copper oxyphosphate according to directions, Ames' Original, if the patient has experienced any discomfort, otherwise the New Process may be used. Wash the cavity with a warm sodium carbonate solution, apply cotton rolls to exclude the moisture, wipe the cavity dry with bibulous paper or absorbent cotton pledgets, fill the deeper portions, covering all or nearly all of the dentinal walls with the iodoformogen, being careful to keep it off the enamel walls. This will set promptly when inserted in the cavity. (If there is danger from thermal changes, a disk of asbestos felt may be placed over the iodoformogen while it is still plastic.) The copper oxyphosphate is then introduced with platinoid or German silver instruments. It may be hardened with a blast of warm air, or by covering it with a piece of hot base-plate gutta-percha, which has been previously provided. As soon as the cement becomes sufficiently hard to resist solution by the saliva, the filling may be trimmed with sharp knife trimmers. This whole operation will consume little more time than it has taken to describe it.

IODOFORMOGEN AND OXYPHOSPHATE OF COPPER FOR FILLING THE TEETH OF CHILDREN.

These materials have a decidedly sedative and stimulant action upon the pulp, besides possessing antiseptic properties. Copper phosphate will restore the contour and the contact, insuring comfort in the mastication of food; it will outlast any other cement, and it will adhere so closely to the walls of the cavity as to require little or no retentive form in the cavity; because of this close adhesion it will preclude recurrent caries. Furthermore, if the contour is lost by attrition, it is easily and quickly restored by scraping the surface and adding some freshly mixed copper oxyphosphate, which will adhere to the old filling. All this can be accomplished without pain, without the use of the dreaded engine or the rubber dam, and is in thorough accord with the principles enunciated. About the only objection is that the filling becomes ebony black. This, however, should not overbalance its good qualities. Sentiment ought not to influence us in so important

a matter as this. The physician does not hesitate to use strychnin and other poisons in proper doses; their toxic properties do not deter him from employing them when they are superior to other remedies, and it would seem that we, too, are justified in selecting our weapons with which to fight disease, for the same reasons.

Of course we must confine the use of copper oxyphosphate to those locations which are inconspicuous. It should not be used in pulpless teeth, for it will stain them, but it will not discolor a vital tooth.

If this paper will encourage the extension of our service to many not now receiving the benefits of our ability to teach and to cure, and will cause us to employ the methods of the physician and surgeon rather than those of the carpenter, its object will be accomplished.

Let us, then, be up and doing,
With a heart for any fate;
Still achieving, still pursuing,
Learn to labor and to wait.

GOLD INSETS.

By W. H. JACKSON, D.D.S., Ann Arbor, Mich.

THE palatal or lingual cusp of a bicuspid is often broken without endangering the life of the pulp. If the buccal wall is in a good condition, it is better to save it without destroying the pulp and substituting a porcelain crown.

Crowns have their life-time. If the beginning of that life can be put off five, ten, or more years, the patient will be that much benefited.

Great care should be taken with the preparation of the tooth, so that the inset matrix may be removed or replaced without distortion.

The illustrations show the method as applied to bicuspids. After proceeding as indicated in Figs. 1–9, remove the piece, and place a small portion of solder (22-karat) in the opening on the articulating surface of the inset, between the two plates toward the mesial and another portion toward the distal surface. Hold the piece in the flame till the solder flows and firmly attaches the two plates along their cervical mar-

Fig. 1. Fig. 2. Fig. 3. Fig. 4. Fig. 5.

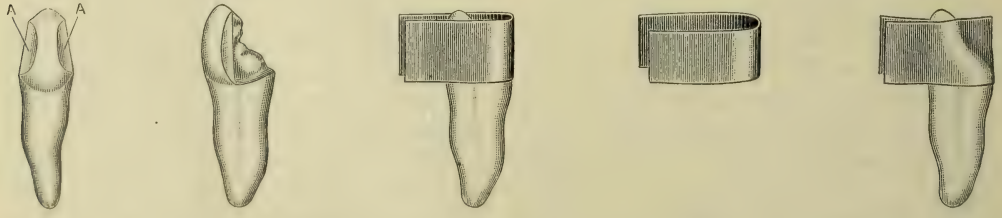


Fig. 1: Left upper first bicuspid, buccal surface. A, A, Bevels, to hold the piece and strengthen the cusp.
Fig. 2: Mesial side, showing cavity and missing palatal cusp.
Fig. 3: Fig. 2 with gold strap (Fig. 4) ready for shaping.
Fig. 4: Pure gold plate, gage Nos. 32 to 36, as case requires.
Fig. 5: Fig. 3 with the strap pinched together to fit it to the uneven surfaces by burnishing.

gins. Replace the piece on the tooth. If the contouring band needs spreading in order to close any gap between the band and the adjoining teeth, it can be easily done. Let the patient close the

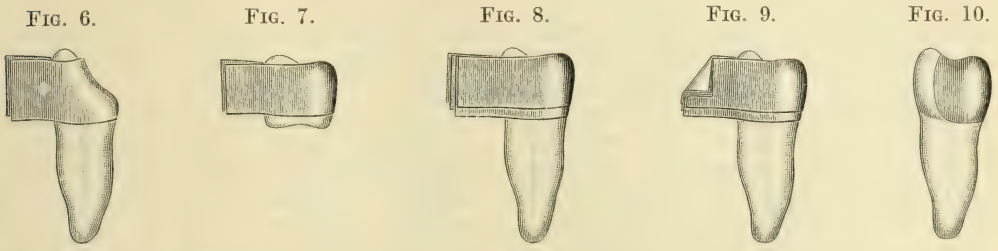


FIG. 6. FIG. 7. FIG. 8. FIG. 9. FIG. 10.

FIG. 6: Fig. 5 with pinched portion clipped.
FIG. 7: A second narrower strap shaped around the palatal surface of a porcelain crown to give it contour.
FIG. 8: The contoured strap slipped over Fig. 6 ready to articulate.
FIG. 9: The same as Fig. 8, with corners of straps turned over to hold them in position.
FIG. 10: The finished inset.

mouth; observe the articulation. Make any correction needed, and remove the piece. With a small brush dipped in chalk-and-water cream paint the surface that comes in contact with the tooth, to prevent the solder from creeping in. Then fill with solder the space between the adapted and contouring bands, trim and finish them to a thin edge of pure gold, and set the piece with cement. Immediately after cementing, take a fine-pointed burnisher and force the soft gold edge against the tooth, thereby displacing the unset cement, so that no cement comes in contact with the secretions.

If your work has been thorough, it will look like a gold filling, and will last and be serviceable for years.

ORAL PROPHYLAXIS AS A MEANS TO PREVENT OCULAR DISEASES.

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(Read before the Eastern Dental Society of Philadelphia, February 18, 1910.)

THE author has chosen this subject, not because he has made some great discovery in oral prophylaxis, not because he has some new method to suggest—for indeed he does not wish to trespass upon the dentists' premises—but because he is convinced that it is a much neglected yet very valuable agent for both the dental and the medical profession. We must not only confine our studies to the cure and replacement of diseased structures, but we must teach the public how to prevent structural degeneration.

THE ESTHETIC VIEWPOINT OF A CLEAN MOUTH.

It is indeed remarkable that with all our advancement in general culture, with

all the progress we have made in the art and sciences, with all the desire for pomp and show and our endeavor in the direction of external appearance, we have still not advanced sufficiently to realize the necessity that from the hygienic as well as from the esthetic point of view the buccal cavity of the human race and the masticatory organs contained therein should receive a little more attention than is ordinarily allotted to them. It is indeed not infrequent that we meet men and women, young and old, who have otherwise been well taken care of by the tailor and dressmaker, have been carefully trimmed by the milliner and beautifully adorned by the jeweler, and who are quite often conversant with the modern ideas in the vast domain of fiction, as propounded by the latest literary productions, and yet whose buccal cavity reveals a striking contrast, with all the signs of negligence, carelessness, and indifference that would lead us to suspect that the parties concerned do not belong to the enlightened twentieth century. From the esthetic point of view there is nothing more disgusting to the refined and cultured mind than an unclean mouth, and nothing indeed is more attractive to the man of clean habits than a beautiful row of well-polished natural teeth.

It is not, however, with the esthetic aspect that we are most concerned in this paper; for, after all, that is a matter of habit, individual taste, and eccentricity, and probably does not belong to our domain, but rather to the ethics of personal appearance. But we are very much interested as intelligent physicians and dentists from the hygienic point of view, for the promulgation of hygienic doctrines is a prerogative of our profession, and it is our moral duty to inform the public on matters that concern their health.

THE BACTERIOLOGICAL VIEWPOINT.

It may be stated as an axiom that the oral cavity is a veritable hotbed for micro-organisms. Both pathogenic and non-pathogenic elements are constant dwellers in the mouth. Among the dwellers in the oral cavity are the staphylococcus pyogenes aureus, albus, and citreus, epidermidis albus, pyocyaneus cereus, albus, and flavus, staphylococcus erysipelosis, micrococcus lanceolatus, micrococcus tetragenus, bacillus pneumoniæ, diphtheriæ, tetani, tuberculosis, coli communis, anthracis, typhosus, and pyogenes fœtidus.

The mouth is thus harboring an army of invasion ready to march through the well-supplied roads of the circulatory and lymphatic systems into various parts of the body, there to set up an inflammation, and therefore must be considered an important though much neglected factor in the causation of many diseases. Very little attention has been paid by the general practitioner to this possible cause for some of the infections which he has to combat, yet a little careful thought could easily convince us of the possibility of infectious germs having their habitat in the mouth, making a little excursion, so as to change the monotony of life, into some other tissues in which they set up an inflammation with subsequent suppuration.

THE CLEANING OF THE ORAL CAVITY.

In our studies on oral prophylaxis it is well to bear in mind that the oral cavity cannot be sterilized and made germ-free, but it can be kept clean. Absolute sterilization of this cavity is apparently not necessary. It seems that the mouth is lined with a peculiar mucous membrane that is quite resistant to infection. Were this not the case, people would have to spend their lives with some ulcerative or suppurative condition constantly present in the mouth, resulting from the pathogenic germs that dwell constantly upon the carious and much-neglected teeth. The mouth need not be sterilized, but must be cleaned. A little time, a little effort, a little attention, is all that is required. Cleansing the oral cavity does not require any expenditure. No fancy antiseptic solution is needed; in fact, no medication at all is required. Water and a tooth-brush

will meet all the requirements, unless there is some special indication for the need of an antiseptic solution.

Under ordinary circumstances let a man with clean habits have his teeth cleaned well by the dentist—a pleasure that requires very little money—let him use daily irrigation in the morning and evening, let him apply the dental brush to his teeth in the morning and evening, and his mouth may be considered as aseptic as possible. This does not refer to cases where there has already been suppuration, we assume in these cases that the dental structures are still well preserved. Such cleaning of the teeth by the dentist would be sufficient if done once in two or three years, entailing very little expenditure.

PUS IN THE MOUTH AND ITS CONSEQUENCES.

There are a great number of people who have never had their teeth cleaned by a dentist. In some of these cases, in consequence of some constitutional condition, possibly a gastro-intestinal disease with acid gastric juice, or rheumaism, syphilis, etc., the structure of the teeth becomes involved, and there may be a continuous suppuration without any accompanying acute inflammatory symptoms. Some mouths are, indeed, a mere repository of pus, which is daily swallowed by the patient. It is well to be reminded that some of the germs that have found a good culture media with good nourishment have grown fat and have become more active, may travel upward as well as downward, and give rise to some inflammation in the antrum, the nose, and the eye. That this is not more often the case is to be explained on the ground that the fluids of the body, the leucocytes usually, combat these micro-organisms, rendering them harmless. But occasionally, because of some reduced resistance, an inflammation sets up that produces marked and painful symptoms.

ACUTE DACRYOCYSTITIS, ITS CAUSES AND TREATMENT.

Acute dacryocystitis is an inflammation of the lacrymal sac which manifests itself in the form of an abscess in the inner angle of the nose, or rather at the naso-ocular angle, which usually requires operative treatment. The treatment is tedious indeed, for as a result of the inflammation the canal becomes less patulous, and the re-establishment of the caliber of the canal requires a long course of probing with Bowman's sounds.

How does an inflammation set up in the sac, and where did the infecting organism come from? We usually shut our eyes and say we do not know; we assume at first a stenosis of the duct, followed by a stagnation of the lacrymal fluid, with subsequent infection carried by the latter. While this is possible, it is not probable. Narrowing of the lumen of a canal is usually the result, not the cause of inflammation. Furthermore, the lacrymal fluid is practically aseptic, and while it is possible that occasionally it carries some germs to the sac, it is more reasonable to assume that since the lacrymal sac is in direct communication with the posterior nares, the mucous membrane of which is a direct continuation of the mucous membrane of the mouth, some micro-organism from that great reservoir has traveled upward and lodged in the lacrymal sac, where as a result of atony of the sac it causes an irritation with subsequent inflammation and suppuration. It is my practice in all these cases to attend to the mouth, nose, throat, and teeth.

CORNEAL INFLAMMATIONS.

The same method of reasoning must be followed when we come to study the various corneal inflammations with pus in the anterior chamber. The difficulty lies not so much in attributing these cases to some unhygienic condition of the mouth, as in explaining why so many patients with an unhygienic and even suppurative condition of the mouth are not more often afflicted with various diseases of the eye.

VARIOUS OTHER OCULAR DISEASES.

Abscesses of the eyelids, sties, marginal blepharitis of the recurrent variety, and inflammations of the conjunctiva the au-

thor has often been able to attribute to a lack of hygienic conditions of the buccal cavity. From the point of view of the dentist, oral prophylaxis is of course considered today of great importance in preserving the integrity of the dental structure, but it should be of no less importance to the physician from the point of view of medical hygiene. Many diseases of the gastro-intestinal tract could no doubt be avoided by a regular *régime* of oral hygiene. Even the ophthalmologist must sometimes determine the etiology of some ocular disease by carefully examining the mouth. Even diseases of the deeper structures of the eye the etiology of which is obscure may be caused by some migrating micro-organism from a diseased tooth or an unclean mouth. In diseases of the dental structures we have swelling of the lids, the degree of which depends upon the degree of the inflammation. This may be accompanied by inflammatory symptoms of the conjunctiva. In the treatment, of course, the dental irritation must be taken into consideration.

DISEASES OF THE ANTRUM AS REFLECTED IN THE EYE.

Diseases of the antrum, a rather painful condition, it should be remembered, will give rise to various symptoms in the eye, such as pain in the eyeball or marked swelling around the eye. The pus may reach the orbital cavity, bulging the eyeball forward and causing an exophthalmus that will tax the acumen of a good diagnostician. Often the protrusion of the eyeball by the rapidity of its development may lead one to diagnose the case as sarcoma situated posteriorly to the globe, and under such circumstances in the treatment one eye would have to be sacrificed by enucleation, while as a matter of fact the trouble lies in the antrum, and is probably caused by some suppurating tooth which has been neglected until the inflammation has reached the antrum and has given rise to this marked condition, which does not require, however, the removal of the eyeball, but rather that of a much less important structure, namely, a tooth, through the alveolus of which the antrum can be drained. The author has in mind a case of this kind in which a diagnosis of sarcoma was made by a general practitioner, which, however, proved to be an abscess in the antrum, and which was cured by the removal of a tooth and drainage through the alveolus.

THE SIGNIFICANCE OF ORAL PROPHYLAXIS.

Oral prophylaxis from the medical and the ophthalmologic point of view is of wider significance than it is usually regarded to be by the dental profession. From the point of view of the dentist oral prophylaxis is considered to be an effort in the direction of "preventing loss of tooth structure as well as restoring that which is lost." Perfect sanitation of the oral cavity for the purpose of local cleanliness and the preservation of tooth structure is of course a consummation devoutly to be wished. The mouth is the vestibule of the human body, and may be reasonably considered as the index to general clean habits. A person whose mouth shows signs of neglect and indifference gives evidence at once of slovenliness and unclean, careless habits, while, on the other hand, a person whose oral cavity shows signs of sanitation and whose teeth shine like sparkling translucent jewels gives evidence not only of a higher sense of esthetics, but also of a regard for clean habits in all matters that require sanitary regulations. From the medical point of view, oral prophylaxis means more than the preservation of the tooth structures, and is of more than merely local interest, for it means the removing of infection from the teeth and mouth and its being kept removed as far as possible, so as to prevent indirectly many possible infections, which may travel to any other part of the body, including the eye. From the medical point of view, therefore, oral prophylaxis does not only prevent the loss of tooth structure, but also many of the diseases that human flesh is heir to. The prevention of pyorrhea by keeping the

pericemental membrane and the adjacent parts in perfectly healthy condition, the prevention of necrosis or of unnatural recession of the gums, the prevention of caries of the teeth, will also prevent the constant swallowing of pus, with the possible result of gastric symptoms and other infections. Both the dentist and the medical man, then, have a clear and distinct motive for oral prophylaxis, *i.e.* the preservation of general health and the prevention of various diseases the primary focus of which is to be found in the infectious nature of a neglected and unsanitary oral cavity.

THE DUTY OF ORAL PROPHYLAXIS AS SHARED BY DENTIST AND PHYSICIAN.

Oral prophylaxis is most effectively practiced in childhood, before caries of the permanent teeth sets in. It is very hard to overcome acquired prejudices and habits, and it is just as difficult to acquire new habits. It is the duty of the dental profession to educate the public to that effect. It is not the author's intention to exonerate the medical profession as to their neglect in this respect, nor would he claim that it is not within the scope of the medical man to teach oral prophylaxis, for he is convinced that various gastric disturbances, leading to acid hyperchlorhydria and eventually culminating in ulcers of the stomach or duodenum, are caused directly by sepsis of the mouth. But we feel that the dentist is to take the initiative in promulgating and spreading the doctrine of oral prophylaxis. The establishment of a dental department by the city board of health for taking care of the poor children is indeed an effort in the right direction. It will educate the poor child to the necessity of attending to the mouth and teeth, a matter that has been sadly neglected in the past, and which, we may say, is still being sadly neglected today. The dental profession will no doubt indorse this statement, for the dentist very often meets with conditions that give clear evidence of neglect. Often young as well as old patients that have never before consulted a dentist, come to his office with neglected teeth, pyorrhea, abscesses, necrosis, or teeth covered with tartar deposits. Modern dentistry of course is accomplishing very much by prosthetic art and by the filling of cavities, yet still more could be accomplished and more serious trouble could be prevented by the early application of sanitary means to the buccal cavity.

The laity can probably best be impressed with the necessity of oral sanitation by appealing to their vanity from the cosmetic and esthetic point of view. The layman will not understand the possible relationship of various diseases to the condition of the mouth, and often evinces surprise when one tries to link a possible chain between his ocular affection and the unhygienic condition of his mouth and teeth.

The medical profession must remember that auto-infection, a term used to describe diseases the etiology of which we do not know, is attributable to sepsis of the mouth. Of course we must have some excuse for our shortcomings, but it is safe to say that many of these conditions of unknown origin have their primary focus of infection in the toxins produced by the multitude of germs in an unclean mouth, from which they have traveled by the continuity of the tissues until they have lodged in some remote organ and have there established a new focus, a new poison-producing station, that gives rise to inflammation of that part.

Yet oral prophylaxis, while important from the medical point of view, is chiefly the function of the dentist. In fact, dentistry must be regarded, when viewed with a clear and unbiased mind, as a special branch of medicine, such as are ophthalmology, otology, laryngology, etc., subjects that deal only with one part of the body. It therefore behooves the dental fraternity to lay stress upon oral sanitation, not for purely local purposes, but as a means for preventing many diseases, including many conditions of the eye that can be directly traced to a lack of hygienic care of the oral cavity. Let us all remember that just as in our moral nature oral prophylaxis, that is, clean

speech, tends to purify our minds and aids us in our upward journey toward higher aspiration, so in our physical make-up oral sanitation tends to purifying and preserving health and preventing disease—nay more, the mouth is the index to the general hygienic condition of our lives.

UNIQUE ALVEOLAR ABSCESSES.

By ISIDORE LETT, D.D.S., Boston, Mass.

ALVEOLAR abscesses are generally caused by some dental infection or traumatism. A direct infection may develop from the use of a septic toothpick, pin, or like implement; indirect infection from a specific disease or putrescent pulp; traumatic infection from the breaking of a toothpick between two teeth or the lodging of a fish-bone under the gum. In locating an alveolar abscess beneath an anatomically sound tooth that is in no need of filling, yet presenting a putrescent pulp, it has seemed necessary to seek its origin in the tooth. It is possible for an alveolar abscess, not occasioned by a diseased tooth, so to pervert circulation as to destroy the pulp of an adjacent tooth, and thus convey the impression that the tooth was the original cause of the abscess.

Early lancing indicated. An alveolar abscess may destroy a large area of tissue in a single day. Instead of waiting to lance until the pus burrows through the process, a seemingly better way of mitigating conditions would be to bur through the process with a spear-pointed drill or trephine to the location of the developing abscess. In performing this there are several possible dangers, namely, perforation of the antrum in the upper bicuspids or molars, or plunging into the inferior dental canal and lacerating its contents; yet, with a fair amount of skill, the operation may be safely performed.

Diagnosing the offending root. It is often difficult to ascertain just which root of a multi-rooted tooth is infected. In the early stages it may frequently be determined by a gentle pressure or tapping on the different corners of the tooth. Given a developing abscess in a first molar, upon tapping the mesio-buccal and disto-buccal surfaces in turn, one will respond with more pronounced sensitiveness than the other, thereby rendering it safe to conclude that the root beneath the most sensitive side is the one to be considered the seat of the infection. In the advanced stages of an alveolar abscess, pain being general, a diagnosis is not easily made by the former method. The Roentgen ray would disclose the location of the abscess.

Given bacteria alike in two mouths, it is amazing to note how long an abscess will remain in one mouth without causing serious effects, and how in the other it will cause considerable destruction of osseous tissue. A few cases in which the causes of disturbance have been difficult to diagnose may be profitably described. It is rare to find an alveolar abscess existing for a period of a year or more without the usual expression of pain and other phenomena usually present in such conditions.

Case I. A woman, under thirty years of age, came to my office for a diagnosis of her case. A soft fluctuating mass occupied the canine fossa. Upon pressure from without, a mass was revealed on the palatal process of the maxillary bone between the right central and second bicuspid. On pressure from within outward, this mass could be pushed from the palatal region and distinctly felt in the canine fossa. Sores had frequently appeared

under the wing of the nose, and after having discharged a drop or two of pus, had healed. Loss of bone, probably caused by absorption due to the presence of pus, could easily be distinguished. The teeth upon the right side had vital pulps with the exception of the right lateral. Upon inquiry, the attending dentist stated that he had found it impossible to open up the entire length of the canal. The operation consisted of a deep incision along the entire length of the canine fossa, and another incision on the palatal aspect of the maxillary bone, directing the knife toward the canine fossa. A considerable amount, about three drams, of thick green pus was evacuated; caries was discovered. The entire cavity was thoroughly curetted, and the end of the root of the lateral incisor was found to be bent almost to a right angle. This was cut off for the purpose of subsequent treatment and preservation of the tooth. This case was a remarkable one, owing to the prolonged presence of pus and carious bone without occasioning the patient any suffering. The cavity was cleansed every day, and a dressing was introduced until complete granulation ensued.

Case II. This case was one of extensive necrosis due to careless extraction. The patient, a woman of approximately forty-five years of age, complained of excruciating pain in the right side of the face and head. Nine weeks previously the patient had consulted a dentist for treatment of an upper right first bicuspid with crown. Extraction was performed, and several days afterward severe pain occurred in that location. The dentist could offer no explanation of this pain, and insistently denied the possibility of any piece of tooth, which the patient seemed to feel, having remained. Various drugs were administered to alleviate the pain. A week later the dentist was again summoned. A swelling had appeared in the region of the wound inflicted by the extraction. The dentist lanced the swelling, but not in the proper place to be of any benefit to the patient, as was afterward proved. Another thorough examination brought forth the dentist's reiteration that no root was present. Meanwhile a physician who had been summoned administered morphin for temporary relief. At the end of eight weeks the patient, being a large woman, had lost forty pounds from lack of rest and sleep, notwithstanding the morphin administrations. My first interview with her occurred at this juncture. The patient's temperature was 103½°, with a pulse of 140. Examination of the mouth revealed considerable swelling, extending from the right central incisor to the third molar. Introduction of a probe disclosed the presence of the root of the first bicuspid which the dentist insisted had been extracted, also necrosis of the adjacent tissues, both osseous and soft. By an immediate operation the root and all diseased tissue were removed, affording instant relief, with subsequent cure. Fortunately the antral wall was not involved. The presence of so much inflammation and pus, together with the failure of the pus to make an exit through the necrosed tissue, constitutes the remarkable feature of this case.

Case III. This case involved the discharge of pus, occasioned by the perforated root of the upper left central incisor, and draining between the upper right canine and the first bicuspid. The patient, a man, consulted a dentist to ascertain the cause of the pus around the right canine and the anterior portion of the first bicuspid. The canine, having been previously treated, was pulpless. The case was referred to me, and examination revealed the four incisors bearing Richmond crowns. The left central, being less firm than the others, because of its gutta-percha setting, was easily removed, disclosing a perforated root. A small flexible probe was introduced through the perforation, following the sinus directed toward the canine. The sinus was so tortuous that it was impossible to penetrate very far. A powerful syringe was inserted in the root of the incisor, and through the perforation a stained solution was forced, which emptied around the canine. Upon subsequent treatment by the former dentist the perforation closed, and the crown was replaced. Occasionally a slight trace of pus is noticed, while formerly there was a free discharge daily.

Case IV. A woman, twenty-seven years of age, complained of a hard growth, of a year and a half's standing, on the inferior left maxillary bone. Examination revealed under the bicuspids a hard tumor of about the size of a pigeon's egg. The teeth on that side were apparently perfect. No cavities or fillings were present, but the first molar was missing. The patient had had a fall from a window when a child, and had landed upon that side of the face; strabismus followed. There was seemingly no cause for the tumor from a dental aspect. The tumor when opened up disclosed a large cavity filled with pus. This was cleansed and curetted without the desired result. The conclusion was arrived at that one of the teeth prevented a proper granulation of the wound. The thermal tests being normal, I decided to open up each tooth

to ascertain if a pulp had been destroyed. Fortunately, the third molar, containing tortuous canals, was attacked first and revealed a putrescent pulp. The tooth was extracted, and the wound healed rapidly.

Case V. A woman, about thirty years of age, on the tenth day of typhoid fever suddenly developed an alveolar abscess in the lower left jaw. The swelling was continuous with the maxillary gland. The diagnosis was typhoid necrosis. Ether was administered, a long, deep incision was made along the border of the mandible within the buccal cavity, and drainage established. The patient being bedridden, it was deemed advisable to drain this abscess without making an external incision in the region of the clavicle. Pressure was brought to bear by the use of bandages wound from the breast. The favorable results of this experiment obviated a serious operation. Upon the patient's recovery from the typhoid, a second operation was performed for removal of necrotic bone.

Case VI. A woman, forty-five years of age, was troubled by the lower right first molar. Consultation with a dentist revealed an abscessed tooth. Unsuccessful treatments followed, until, in despair, the tooth was extracted. The usual beneficial results were not forthcoming; on the contrary, the pain increased, necessitating the continual use of opiates. The woman being sent to me, I discovered upon exploration an abscess on the lingual surface of the jaw. Curetting of the entire alveolar tissue resulted in complete recovery. In conversation with the dentist who had performed the extraction, I was told that the sac had come away with the tooth. This case involved two abscesses, one being the result of a putrescent pulp, and the other the outcome of an infection from the first.

To insure a successful issue it is always advisable after the extraction of abscessed teeth thoroughly to curet and cleanse the alveolar socket.

FLETCHERISM, AND SOME OF ITS EFFECTS ON NUTRITION.

By JOHN B. WEST, D.D.S., Groton, N. Y.

(Read before the forty-second annual meeting of the Sixth District Dental Society of the State of New York, Binghamton, N. Y., April 29, 1910.)

SOME years ago Mr. Horace Fletcher, an American, ready to retire from active business life, made application for life insurance and was refused. His symptoms were obesity, shortness of breath, dyspepsia, loss of elasticity and keenness; in short, all those troubles that we are accustomed to associate with advancing years. He consulted medical men both in America and Europe, but without receiving any help. One summer, being in Chicago on some business which required a great deal of tedious waiting, he used to get through his meals as slowly as possible to help pass away the day. He observed several curious effects from this—hunger was less frequent, he ate less, his weight decreased, and in the course of time he entirely recovered his health. The physiological discovery made by Mr. Fletcher has come to be called not inappropriately, "Fletcherism."

Mr. Fletcher's method of taking nutrition may be expressed in two rules: (1) Mastication, and (2) Following the instinct regarding the special senses of taste and appetite.

(1) *Mastication.* By mastication Fletcher means thorough mastication of food to the point of involuntary swallowing, the attention not being fixed on the mechanical act of chewing, but on the tasting and enjoying of food, liquid food being sipped and tasted, not drunk down like water. There should be no forcing or holding of food toward the anterior part of the mouth, or counting the chews, or allowing the tongue muscles to become fatigued by any unnatural effort or posi-

tion, or in any way making eating a bore. On the contrary, one should be in a happy frame of mind and thoroughly enjoy his food, for Pawlow has shown that without such attention and enjoyment of food the secretion of gastric juice is lessened. To quote from Professor Irving Fisher: "The point of involuntary swallowing is thus a variable point, gradually coming later and later as the practice of thorough mastication proceeds, until the result is reached that the food remains in the mouth without effort and becomes practically tasteless. Thus the food, so to speak, swallows itself, and the person eats without thought either of swallowing or of not swallowing it; swallowing is put in the same category of physiological functions as breathing—which ordinarily is involuntary."

Since Dr. Ernest Van Somern of Venice, Italy, read a paper before the British Medical Association in 1901 on the principles of nutrition as advanced by Horace Fletcher, some of the greatest physiological experts in the world have been investigating human nutrition. Two of these experts, Dr. Hubert Higgins, formerly demonstrator of anatomy at the University of Cambridge, Eng., and Professor Paul Hègèr, professor of physiology in the University of Brussels, undertook anew the study of the first three inches of the alimentary canal of man, giving scientific support to Mr. Fletcher's ideas on mastication and insalivation. Dr. Higgins and Professor Hègèr found that Gegenbaur, a famous German anatomist, had made a statement in his writings that had passed unnoticed by both anatomists and physiologists until Mr. Fletcher stirred up interest in this subject. On page 90 of Gegenbaur's Anatomy ("Anatomie der Wirbelthiere") the following passage is found: "The bifurcation of the alimentary canal below the soft palate does not depend only on its relation with the epiglottis, but also on the condition of the food. The exclusive use of this means of swallowing is only possible with finely divided food. . . . I have called this way of taking food POLTOPHAGY (*poltos,* masticated, finely divided), and the other, PSOMOPHAGY (*psomos,* biting, tearing)."

By a series of experiments Dr. Higgins and Professor Hègèr found that the muscles of the soft palate could produce both a negative and positive pressure, and that the soft palate is capable of making the mouth cavity airtight. When a mouthful is swallowed in a gulp, the soft palate has a sustained backward movement, an instance of psomophagic swallowing, and when the food is finely masticated, there is a forward movement of the soft palate, an instance of poltophagic swallowing. Thus man has both a psomophagic and a poltophagic faculty. Dr. Higgins remarks, "In the case of the anthropoid apes and man there has been a shortening of the upper jaw from before backward, on account of the assumption of the erect posture, which has resulted in the soft palate becoming more vertical, and thus enabling psomophagic deglutition to be practiced." To recapitulate, Mr. Fletcher has drawn attention to a human faculty that was not recognized. If this process is used to its full extent, a certain series of phenomena result, some of which we will consider in this paper.

(2) *Following instinct.* Never eat when not hungry, even if several meals are skipped before you have a normal appetite. When taking a meal one should not be guided by the quantity of food offered, or by past habit, or any theories as to the amount of food needed. The natural appetite alone is consulted, and one selects from the food available only those kinds and amounts that are actually craved by the appetite. Thus the body selects through normal appetite the food that it requires.

Appetite had been somewhat overlooked by physiologists on account of the observations of Dr. Beaumont in the celebrated case of St. Martin, who had an aperture made in his stomach as the result of a gunshot wound. These observations were thought to show that the stimulation for the secretion of gastric juice was mere contact of the food with the walls of the stomach. The contact stimulus for the flow of gastric juice has been disproved by the researches of Professor Pawlow, the eminent Russian physiologist. The experiments of Pawlow

prove that Fletcher is correct in the value he places on appetite and taste in feeding. Professor Pawlow says in summing up his conclusions: "It is only by the establishment of this passionate desire for eating that unerring and untiring nature has linked the seeking and finding of food with the commencement of the work of digestion. That this factor, which we now have so carefully analyzed, stands in closest relation with a phenomenon of daily life, namely, appetite, may easily be predicated. That agency which is so important to life and so full of mystery to science becomes at length incorporated into flesh and blood, transformed from a subjective sensation into a concrete factor of the physiological laboratory. We are justified in saying that appetite is the first and mightiest exciter of the secretory nerves of the stomach."

Mr. Fletcher lays strong emphasis on taste as the guide and guard of nutrition. He says: "Taste, in its normal condition, when allowed to direct or advise, serves several important functions, not the least of which is as first assistant to appetite. Appetite craves the kind of nourishment the body needs, invites to eating, gives enjoyment during the whole time needed for the fluids of the mouth and stomach to do their part of the digestive process. Taste ceases when the food is ready for the stomach and thereafter fails to recognize the indigestible sediment which remains in the mouth after nutriment has been extracted; and in these discriminations, if consulted and obeyed, taste and appetite prevent indigestible matter from entering the system to burden and to clog the lower intestines, form deposits in bone, cartilage, and kidneys, inflame the tissues and otherwise create conditions favorable to the propagation of the microbes of disease."

SOME EFFECTS OF FLETCHERISM ON NUTRITION.

The practice of Fletcherism produces marked changes in nutrition. Less food is taken, the appetite becomes more discriminating, and meals are reduced to one or two per day.

From January to June 1906, at Yale University, Professor Irving Fisher conducted with nine healthy students an experiment in thorough mastication and instinctive eating to determine the effect of diet on endurance. "At the outset, the men consumed daily an average of 2830 calories. A calory is the amount of heat required to raise the temperature of one kilogram of water 1° C. Of these 2830 calories, 210 were in the form of flesh foods, such as meats, poultry, fish, and shell-fish, 2.6 calories of proteid being ingested for each pound of body weight. At the close of the experiment, the per capita calories had fallen to 2220, of which only 30 were in flesh floods, and the proteid had fallen to 1.4 calories per pound of body weight. In other words, the total calories of the daily ration had dropped off about 25 per cent., the proteid about 40 per cent., and the flesh foods over 80 per cent., or to about one-sixth of their original amount.

When Fletcher first advanced his ideas he found that physiology had a considerable bogy to confront him with, called the Voit standard of nitrogenous nutrition. He was informed that before he could obtain acceptance of his claims, he must prove his standard of nutrition to be nearer the normal than the famous Voit standard.

Mr. Fletcher was fortunate enough to find a practical sympathizer in Professor Russell H. Chittenden of Yale University, who is one of the most eminent of physiological chemists. Professor Chittenden found that, during an experiment of seven days, Mr. Fletcher consumed an average of only 45 grams of proteid per day, and that fats and carbohydrates were taken in quantities only sufficient to bring the total fuel value up to a little more than 1600 large calories. These figures speak for themselves when we recall that the Voit standard demands at least 118 grams of proteid and a total fuel value of 2000 large calories daily. It may be said in explanation of this experiment that the body weight remained practically constant during the seven days' period, and that the intake and output of nitrogen were not far apart; in other words, there

was a close approach to what physiologists call a nitrogenous equilibrium. The question might be asked: Could a man on such a diet, even though it suffice to keep up body weight and physiological equilibrium, do work to any extent? In reply to such a possible question, Mr. Fletcher was given the same kind of exercises that are given the 'varsity crew at Yale. Dr. W. G. Anderson, director of the Yale gymnasium, in speaking of this experiment, gives his conclusions in the following words: "Mr. Fletcher performed this work with greater ease and with fewer noticeable bad results than any man of his age and condition I have ever worked with."

We have gone into details concerning this experiment, since the result is the same as that of the more elaborate test made by Professor Chittenden on students, athletes, and soldiers of the United States army. By these extensive and laborious researches of Professor Chittenden it is proved that men can play better, study better, work better, and have better health, not on the Voit standard, but on one-half or one-third the amount of nitrogen prescribed therein as being essential.

In conclusion, those who practice the rational and natural method of taking their nutrition as advocated by Mr. Fletcher, observe nearly the same phenomena as Professor Fisher observed at Yale as the result of the experiment to which we have already referred. There is a slight reduction of the total food consumed, a large reduction of the proteid element, especially of flesh foods, a lessened excretion of nitrogen, a reduction in the odor, putrefaction, fermentation, and quantity of the feces, a slight loss of strength, an enormous increase of physical endurance, a slight increase in mental quickness. These phenomena vary somewhat in different individuals, the variations corresponding, in general, to the thoroughness with which one carries out the ideas of this method of nutrition.

CONDITION OF THE TEETH OF PUBLIC SCHOOL CHILDREN IN THE STATE OF NEW SOUTH WALES.

Results of an Examination made by the Dental Association of New South Wales.

[From "Report upon the Physical Condition of Children Attending Public Schools in New South Wales," a bluebook issued by the Department of Public Instruction, N. S. W.]

THE examination of the teeth of public school pupils by the Dental Association of New South Wales, a matter which has hitherto been limited to schools in Sydney and suburbs, was extended last year to embrace examinations in a number of country centers. As stated in last year's Physical report, the dental inspection was carried out quite gratuitously by the Dental Association, every facility being placed at their disposal by the Department, which also supplied forms, printed charts, etc.

In the previous report (1908) records of the inspection of 4076 metropolitan children were tabulated. For 1909, records of the inspection of 3574 country children were received. [A statement in detail showing the condition of the teeth and mouths of these children at each age, from four years to eighteen years, is given in the report.] A comparison of these figures for country children with those already published for metropolitan children is furnished in the following tabular summary:

Comparison of Dental Condition—Sydney and Country Children.

	Boys.		Girls.		Total.	
	Sydney.	Country.	Sydney.	Country.	All boys.	All girls.
Individuals examined	2,631	1,802	1,445	1,772	4,433	3,217
Permanent teeth examined	49,820	30,507	26,625	33,164	80,327	59,789
Temporary " "	11,766	11,183	6,470	9,140	22,949	15,610
Permanent " defective	16%	11%	19%	14%	14%	16%
Temporary " "	29%	30%	35%	36%	30%	35%
Pupils with dirty mouths	13%	19.3%	12%	11.3%	15%	11.7%
Defective teeth per child (aver.) . .	4.4	3.9	5.2	4.5	4.2	4.8

[In addition to the 3574 country children included in this table, 422 additional dental records were received late from the schools at Goulburn. A summary of the general results is given in the table on page 757, which includes the additional records.]

This summary shows that a detailed examination has been made of 7650 children in various parts of the state. It teaches that both in the city and in the country districts the teeth of girls are more defective than those of boys; also, that defects are much more common among teeth of the first set than among permanent teeth, the proportion being as high as 2 to 1. The reason for the preponderance of caries in the first teeth seems to gather round the fact that so many children leave the primary school at an early age. Even for those who remain till the age of fourteen, there is not very much time for decay to assert itself prominently; and a number of children leave school as early as twelve and thirteen.

The first teeth among country children are slightly more defective than those of Sydney children; 29 out of every 100 teeth being faulty in the case of Sydney boys, while 30 per 100 are faulty in the case of country boys. Among the girls the figures are 35 (Sydney) and 36 (country). The difference is, therefore, only very slight as regards both sexes.

With respect to the permanent or second set, however, country children have much better teeth than city children. Among metropolitan boys, 16 per cent. of the teeth are carious as against 11 per cent. among country boys. The city girls have 19 per cent. of their teeth carious as against 14 per cent. among country girls. The figures giving the percentage of pupils with dirty mouths (that is, whose acquaintance with the tooth-brush is very remote) make it evident that boys are more negligent in this matter than girls. Country girls are shown to possess the cleanest teeth and mouths, whilst country boys are the greatest offenders against oral cleanliness. At the same time, however, the averages show that the least number of defective teeth per child (3.9) is found among country boys. Considering metropolitan and country children collectively, the highest average of defective teeth is found among Sydney girls (5.2 per child).

When making their records the visiting dentists took notes showing the type of boys and girls in country districts so far as physical appearance is concerned. Of 1802 boys examined, 410 were found to be of blonde type, 418 dark, and 930 medium. Of 1772 girls examined, 432 were blonde, 322 dark, and 753 medium. Out of 3574 country children examined, therefore, 57 per cent. were of medium type, 23 per cent. of blonde type, and 20 per cent. dark or brunette. A similar examination, upon a very much more extensive scale, was made in Germany by Virchow, who found that 32 per cent. of the German school children were

blonde, 14 per cent. brunette, and 54 per cent. of mixed type.

Children of twelve years, in Swiss schools, are required to have their teeth examined, that being an age when decay is regarded as making rapid progress. Reports show that, on an average, Swiss children have 3.7 decayed teeth at this age. (Evidence A. J. Pressland, Royal Commission on Physical Training, Scotland.) Among the country children of twelve years in this state the average of decayed teeth is, for boys, 3.2, and for girls, 3.9.

In last year's report, two periods were noted among city children at which their teeth were specially defective. Precisely the same periods are noted now in the case of country children. The first period occurs from six to seven among both sexes, and is associated with the shedding of the first teeth and the cutting of the second set. The second period occurs from the ages fourteen to sixteen among the boys, and from thirteen to fifteen among the girls, and is apparently associated with the pubertal changes.

The subjoined table shows the country centers from which dental records were received, and gives an indication of the general condition of the children's teeth. Of the children tested, those attending schools in Narrandera, Hay, Bourke, Wagga, and Newcastle were found to have fewer defective teeth per pupil than the state average. In the case of children at Cowra, Goulburn, and Yass, the number of carious teeth was found, on the other hand, to be considerably above the state average. Good dental conditions would appear to accompany physical robustness in Central Riverina, but statistics indicate that children out on the Western Plains, in districts such as Narrandera, Hay, and Bourke (where the physique is somewhat below normal), have very much better teeth than the more robust children on the Tablelands:

CONDITION OF CHILDREN'S TEETH IN COUNTRY CENTERS.

COUNTRY CENTER.	No. of Pupils Examined.	NO. OF TEETH EXAMINED.			NO. OF CAVITIES.		No. of Teeth Defective.	No. of Defective Teeth Per Pupil.
		Permanent.	Temporary.	Total.	Permanent Teeth.	Temporary Teeth.		
Boys:								
Narrandera, Hay, and Bourke	307	5,727	1,640	7,367	650	380	1,021	3.3
Wagga and South Wagga	394	6,757	2,188	8,945	934	462	1,387	3.2
Newcastle District	909	14,743	6,120	20,863	1,130	2,297	3,428	3.7
Goulburn and Yass	255	5,214	864	6,078	1,152	172	1,363	5.3
Cowra	139	2,229	998	3,227	549	409	872	6.2
Girls:								
Narrandera, Hay, and Bourke	320	6,310	1,359	7,669	1,035	244	1,274	3.9
Wagga and South Wagga	211	3,927	1,066	4,993	613	296	908	4.3
Newcastle District	1,076	19,641	6,017	25,658	2,111	2,578	4,658	4.3
Goulburn and Yass	258	5,836	584	6,420	1,579	185	1,772	6.8
Cowra	117	2,150	613	2,763	538	274	740	6.3

Extracts from the medical inspectors' reports regarding dental conditions are subjoined:

Dr. Roth states:

The teeth of the children are still very much neglected. Parents want special instruction in the care of the teeth, and dental

dispensaries should be established in the poorer districts, where good dentists could give their services gratuitously, as is done by the medical men connected with our hospitals.

As importance is attached to the necessity for teachers having their mouths in good order before entering the Department, we may expect that the children will benefit from the good example set them by their teachers, and pay more attention to their teeth than formerly.

Dr. Grace Boelke states:

Cleanliness and care of teeth. Oral sepsis much neglected. It is very seldom that the children examined habitually clean their teeth. The large majority of children examined have defective teeth which have received no treatment.

Dr. May Harris (Newcastle) states:

The children who regularly brush their teeth are in a hopeless minority.

There seems to be an almost universal ignoring, or ignorance, of the fact that even a single carious tooth is detrimental to health. Few, if any, realize the fact that an unclean mouth is an ideal medium for bacteria, and that many of pathogenic significance, such as those of diphtheria, pneumonia, etc., are often found in ordinary mouths, and only want some exciting cause to produce their ravages.

Children's mouths are frequently full of broken, offensive teeth, and unless pain is intolerable, no effort is made to remedy the evil. This applies more directly to the primary teeth, the secondary set rarely having time before fourteen to become markedly carious.

Another bad effect produced by neglect of the primary teeth, and this is aggravated by nasal obstruction, is that the second teeth are unable to erupt in their correct position, and consequently lie at all angles in the mouth, the lateral even being directly behind the central incisors. These crowded mouths are comparatively common.

Summary.

(1) During 1908–9, dental records of 3996 children in country districts were received from the Dental Association of New South Wales.

(2) The teeth of girls in the country districts are more defective than those of boys. This was found to be the case also in Sydney.

(3) Defects are much more common among teeth of the first set than among permanent teeth.

(4) The first teeth among country children are slightly more defective than those of metropolitan children, but country children have much better second teeth than have city children.

(5) In the use of the tooth-brush, boys are more negligent than girls, and the cleanest teeth and mouths are found among country girls.

(6) Of 3574 country children examined, 23 per cent. were found to be of blonde type of appearance, 20 per cent. dark or brunette, and 57 per cent. of medium type. In Germany the corresponding percentages are 32, 14, and 54.

(7) From dental statistics received so far, children on the Western Plains (Narrandera, Hay, and Bourke) are shown to have better teeth than the more robust children on the Tablelands.

(8) The medical inspectors' reports all point to the fact that the teeth of school children are much neglected.

CORRESPONDENCE.

DENTISTRY IN ITALY: THE "ISTITUTO STOMATOLOGICO ITALIANO."

Sir,—I have the honor to acquaint you with the fact that by ministerial decree the "Istituto Stomatologico Italiano" has been recognized as a school of dental surgery, with the right to grant special degrees. The decree was signed by the Italian government after the approval of the Superior Council of Public Instruction, who appreciate the organization of the school, which fulfils the most modern scientific and technical requirements.

The Istituto Stomatologico Italiano has been founded after the best methods of the European and American schools. We give here a brief *résumé* of the different matters taught, with the persons to whom the teaching is intrusted:

(1) *Special Dental Pathology*—Prof. Dott. Ludovico Coulliaux, Professor of Dental Surgery at the University of Pavia.

(2) *Special Oral Pathology*—Prof. Dott. Riccardo Avanzi, Professor of Dental Surgery at the University of Padova.

(3) *Materia Medica and Therapeutics*—Prof. Dott. Camillo Rovida, Professor of Dental Surgery at the University of Pavia.

(4) *Odontotechnics and Dental Facial Prosthesis*—Prof. Dott. Carlo Platschick, Professor of Dental Surgery at the University of Pavia and at the Higher Clinical Institutes, Milan.

(5) *Surgical Oral Clinic*—Prof. Dott. Iginio Tansini, Director of Surgical Clinic at the University of Pavia.

(6) *Oral Bacteriology*—Prof. Dott. Adriano Corradini, Professor of Bacteriology at the University of Pavia.

(7) *Dental Anatomy and Histology*—Prof. Dott. Gaetano Fasoli, Professor of Dental Surgery at the University of Bologna and of Surgical Pathology at the University of Siena.

(8) *Operative Dental Surgery*—Dott. Paolo Bottoni, M.D.It. and D.D.S.Philadelphia; Dott. Ciceri, G. B., M.D.It. and L.D.S.Eng.

(9) *Orthodontia*—Dott. A. Maggioni Winderling, M.D.It. and educated in dental surgery at the Royal Dental Hospital, London.

(10) *Radiology*—Dott. Giorgio Coen Cagli, M.D.It. and educated in dental surgery at the Royal Dental Hospital, London.

All the house surgeons and demonstrators have been trained in dental surgery in the best European dental schools.

As is seen by the foregoing list, the staff is of absolute proficiency, and the teaching is not lacking in any point. So it will be understood how, regardless of any bias respecting the organization of the dental school and the necessity or otherwise of the M.D. degree, the undersigned, and all the teachers with him, have found highly offensive the letter of Mr. Augusto in the March issue of the DENTAL COSMOS. [See page 325, "The Barring of the D.D.S. in Italy," by A. Augusto, D.D.S.]

We send the above information not because we have taken up any challenge from Mr. Augusto, but because his letter appeared in the DENTAL COSMOS, one of the most widely circulated and highly reputed dental journals. We are anxious to publish an early rectification of the letter of Mr. Augusto, inasmuch as the founding of our institute has been prompted, not by personal interest, as Mr. Augusto states, but solely by the desire to elevate our specialty to its proper status. We hope therefore that you will, in your fairness and kindness, promptly publish this word of rectification.

Yours truly,

C. PLATSCHICK.

MILAN, May 12, 1910.

PROCEEDINGS OF SOCIETIES.

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK.

Monthly Meeting, February 1910.

A REGULAR meeting of the First District Dental Society of the State of New York was held on Tuesday evening, February 8, 1910, at the Academy of Medicine, No. 17 West 43d st., New York city.

The president, Dr. Taylor, being absent on account of ill health, the vice-president, Dr. Nash, occupied the chair, and called the meeting to order.

The Secretary read the minutes of the last meeting, which were approved.

REPORT OF THE EXECUTIVE COMMITTEE.

Dr. W. W. WALKER. At our March meeting, the subject will be "What Shall be the Future of Dentistry, and of Dental Societies, in Our City?" which will be open for discussion by members of the society.

We are disappointed by the absence of one or two speakers who were expected tonight. Dr. George S. Allen of New York is ill, and Dr. G. V. I. Brown of Milwaukee was called home. Dr. Brown arrived in Philadelphia yesterday, and went over the paper with Dr. Kirk, but he received a telegram recalling him immediately to an important surgical operation, so he had to take the next train home. I move that the part he was to take in this discussion be published with the rest of the proceedings.

Dr. NASH. That will go without any motion.

The paper of the evening was read by Dr. EDWARD C. KIRK of Philadelphia, and was entitled "A Consideration of the Question of Susceptibility and Immunity to Dental Caries."

Dr. KIRK. Before beginning the reading of the paper, I should like to say with reference to it that my purpose in presenting this subject has been mainly to attack the question of dental caries, or the problem of dental caries, from a somewhat different angle of view. I have been interested in the various studies of this subject that have been presented from time to time recently in our literature, and it seems to me that much that has been said has been away from the beaten track, and I wish to call attention to this tendency to get away from what we already know about dental caries, and endeavor to divert our lines of thought back into the established channels, which have been determined by careful research, and see if we can arrive at a clearer understanding of the subject.

[Dr. Kirk then read his paper, which is printed in full at page 729 of the present issue of the COSMOS.]

Discussion.

Dr NASH. I have just been informed that Dr. J. Leon Williams of London has remained here especially to discuss this paper. He was to have sailed yesterday, but consented to remain. We shall all be glad to hear from Dr. Williams.

Dr. J. LEON WILLIAMS. One often hears the remark passed on some contribution to the literature of our profes-

sion that it is a milestone marking progress. While this saying sometimes expresses more kindliness of intent than discrimination, while the alleged milestones often mark very short measure, or are not infrequently mere boulders by the wayside, it does not follow that the remark is not sometimes true. It is true of the paper we have had the pleasure of listening to this evening. This report marks a very distinct advance in the scientific literature of dentistry.

Different workers in related fields of investigation are like ironsmiths engaged in chain-making. Each is employed in forging out links on the anvil of experience with the hammer of research. All of these links are numbered, although not always consecutively, and occasionally a link or a few links are completed which we see at once unite other previously disconnected links or lengths of chain. Such is the nature of Dr. Kirk's contribution presented here tonight. It has united former pieces of work, and it seems to me to almost complete the chain of evidence, to enable us to see all of the long list of discovered facts relating to dental caries in their sequential order.

The completion of this chain has been a difficult task, but the work has been accomplished almost entirely during the past twenty-five years. A few days ago I was looking over the volume of the Dental Cosmos for 1874, and I came upon some remarks which Dr. Black contributed to the discussion of a paper by Dr. Cushing, and I was particularly interested in this statement made by the man who has since contributed much to the elucidation of this difficult problem. Dr. Black said, "When one of the great Greek physicians was asked, thousands of years ago, Why do teeth decay? he answered that it was on account of the bad condition of the humors of the body, —and that is about as much as *we* know about it." Throughout that discussion there was no mention of micro-organisms as contributing anything to the phenomena of dental caries, so you see the work to which Dr. Kirk has made an important contribution today has all been accomplished since 1874. I am not going into any detailed history of that work, as you are all familiar with it. The late Dr. Miller laid the first solid scientific foundation for it in that epoch-making book "The Micro-organisms of the Human Mouth." Dr. Black made a valuable contribution to the subject when he showed that the causes of caries were not contained in the teeth themselves, but must be due to conditions of environment.

My own contribution to the solution of the problem was in the demonstration I was able to give of the universal presence of a bacterial plaque containing, among other forms of micro-organisms, the lactic acid bacillus, which Miller had proved was the chief cause of decay of the dentin. I showed that everywhere beneath these bacterial plaques the enamel was being acted upon by an acid which eventually completely destroyed it, but I was unable to give any explanation of the fact that these plaques formed in some mouths but not in others, and on certain teeth in any given mouth but not on others in the same mouth. That explanation has been largely given us in the paper just read. It may be interesting in this connection to recall a bit of unpublished history. At a dinner following the reading of my paper on the "Pathology of Enamel" in this room about a dozen years ago, Dr. Northrop, who presided with his usual dignified grace at the end of the table, asked me if I had any suggestion to make as to future work in the field traversed by my paper. I replied, suggesting the formation of a fund to encourage research work on the fluids of the mouth, as it appeared to me then that the last uniting links in the chain of evidence would be found here. Mr. Lewis, the late president of The S. S. White Dental Mfg. Co., offered one thousand dollars toward such a fund if the Odontological Society, before which my paper was read, would contribute an equal sum, but the society failed to avail itself of the generous offer. Later the New York State Society took the matter up, with results known to all of you. In the few moments which I had this evening to look over Dr. Kirk's

paper I was somewhat surprised to find the importance that had been attached, in certain quarters, to the supposed antiseptic properties of the saliva. I had supposed that the only significance, for instance, attached to the presence of sulfocyanate of potassium in the saliva was its possible solvent action on the bacterial plaques. But in the meantime Dr. Kirk had attacked the problem, and in a paper on "The Saliva as an Index to Faulty Metabolism," read at Chicago in 1903, he said: "Certain conditions of the oral fluids may be the cause of certain mouth-lesions *and probably of dental caries.*" Thus he seemed to be aware seven years ago that he was on the right track.

In August 1899, Dr. Black read a paper before the National Association in which he said, after referring to my paper already mentioned: "Observations already made render it certain that caries of the teeth has its beginning only when the conditions of the oral secretions are such that the micro-organisms causing caries form gelatinous plaques, by which they are glued to the surfaces of the teeth"; and then, a little farther on in his paper, he added, "The formation or failure of formation of the gelatin plaques seems to depend upon something in the saliva the nature of which is as yet unknown." That is significant in view of what has been presented to us tonight, and I mention these statements to show you that all of us who were working in this field eight or a dozen years ago knew where the last important facts were hiding—but it has remained for Dr. Kirk to uncover this hiding-place. We knew that the adhesive substance which held the bacteria together and glued them to the enamel somewhat resembled gelatin, but was also unlike it. As far back as 1886 Dr. Black said, "I should say that gelatin is not quite the proper word to use in this connection. The substance does not melt or soften at high temperature, and in many respects differs from what we know as gelatin." In my paper on "The Pathology of Enamel" I nearly always referred to this substance as "gelatin-like," because I saw the improbability of its identity with gelatin. All of this is interesting because it indicated or suggests the intricacy of the problem and the difficulty Dr. Kirk has overcome in clearing it up.

This condition of susceptibility or immunity as applied to dental caries has little in common with the circumstances and conditions as applied to other diseases caused by bacteria or the toxins of bacteria. There is no circulating medium in the teeth through which we can distribute a serum for the purpose of producing a condition of artificial immunity or an antitoxin with the object of neutralizing the bacterial poison. The disease is not one of disturbed function, but of destruction of tissue by purely local action. The problem of immunity is not primarily concerned with bacterial action at all, but with the deposit of mucin. If there were no deposit of mucin there would be no bacterial plaques and consequently no bacterial action on the teeth. Now we begin to see plainly why it is that we have been able to do but little in the direction of producing a condition of immunity to dental caries by the use of antiseptic dentifrices. These applications do not destroy the bacterial plaque chemically, and therefore have but little effect except in so far as they contribute to the mechanical action of the tooth-brush. We also see why it is that the up-to-date prophylactic treatment is so successful. This treatment destroys the bacterial plaque and prevents its re-formation, and that is the secret of the whole matter of immunity—no bacterial plaque, no decay of the teeth. The next great question is, Shall we be able to discover chemical means for destroying the bacterial plaque or some therapeutic means for preventing its formation?*

* I had not read Dr. Kirk's paper when I wrote those lines, but I am deeply interested in the suggestion which he gives of a possible solution of the whole problem by the control of nutritional conditions. This is in the direct line of the finest results of modern scientific research. Dr. Kirk's statement that observations conducted at his college clinic convinces him that the most active expres-

The man who can do this will be one of the greatest benefactors of mankind who has ever lived, and I think it highly probable that this will be accomplished sooner or later. The paper of the evening is a long step forward in this direction. I said a dozen years ago that I thought we were within measurable distance of preventing at least two-thirds of the ravages of dental caries. That was thought by many at the time to be an unwarrantedly optimistic statement, but today there are men in our profession who will tell you that it is possible to do even better than that.

And with the demonstration that we have had tonight, and the indications on every hand of a great awakening of public interest and intelligence in oral hygiene, it does seem as though dentistry is about to come into its own, and instead of being, as an eminent medical authority once remarked to the essayist of the evening, "a badge of partial culture," it is well on the way toward supplying the most important conditions on which the medical practitioner must rely for his own success.

From the purely scientific point of view our profession, on the whole, occupies a position of considerable weakness because of its inability or its neglect to confirm the conclusions reached by the few who give more or less of their time to original research work. In most fields of exploration the announcement of an important discovery is not usually accepted as a scientific demonstration until it is confirmed by some one or more investigators who have traversed the same ground. This rarely occurs with research work in dentistry. Of course, we all know Dr. Kirk sufficiently well to accept such a report as he has given us tonight without doubt or question, but I imagine that our acceptance of his report will give him far less satisfaction than would the confirmation of his work by a colleague.

Personally, I should like to tender my heartiest congratulations to Dr. Kirk, both because of the nature of the work done and also because I stand in the position of one who is delighted in finding his own work confirmed by an exceptionally able co-worker, after many years.

Dr. G. V. I. Brown. The reasonable limitations of individual discussion preclude an attempt to follow in detail each of the several divisions of the subject of dental caries that the essayist has presented for our consideration in his complete treatment of the subject. It seems to me, however, that it is practicable and by all means advisable for us to give a little thought to the three principal divisions which naturally suggest themselves.

First: With characteristic attention to detail, the author has given us a *résumé* of the important steps by which our knowledge of the subject of dental caries has ascended—full credit being given to those who from time to time have brought forward new thoughts or discoveries which the light of subsequent investigation has proved to be true.

The second calls attention to some of the unproved theories, and shows wherein by experimental research the findings have thus proved unsatisfactory.

Third, we have been presented with an original thought in the nature of a discovery which at once demands our best efforts in proof or disproof, so that the final result in the alchemy of scientific and clinical experience may be such as to set upon it a seal which shall mark its true place in the records of original research.

It seems to me that credit for the beginning of our knowledge of bacteriology

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sion of caries occurs in mouths where there is an alkaline reaction reminds me of several confirmatory facts. I remember that thirty years ago there was an almost complete unanimity of opinion that sodium bicarbonate was the one important ingredient of a dentifrice. Continued use of this substance, however, showed that the inference on which the conclusion was based had no scientific foundation. Goadby, in his book on the "Mycology of the Mouth," quotes an observation of mine on the fine dentures of the Sicilians who work in the lemon orchards of Sicily and are greatly addicted to munching the very acid lemons of that beautiful island.

might properly be given to Leeuwenhoek, who first demonstrated in water and in human intestinal contents the contagium vivum—the credit to be shared in varying degree by Müller, who in 1785 undertook the systematic classification of micro-organisms, and by his followers, until 1869, when Pasteur gave the first definite idea of the physiology of micro-organisms through his experiments upon lactic acid formations. Long before 1883, the date of Miller's wonderful work, the fact that acid was an active agent in dental caries was known, and the practice of prescribing precipitated chalk to be rubbed about the teeth at night, and lime-water as a mouth-wash, was a matter of general good practice. To Miller, however, belongs the credit of giving us the first complete scientific classification and description of the nature of the bacteria of the mouth, and definite proof of the fact that this acid is produced by the bacteria, and not the bacteria by the acid. It was upon the demonstration of that apparently small but really all-significant point that the whole structure of former theories with regard to dental caries was demolished, and a new theoretical edifice erected upon the ruins. The demonstration of the bacterial plaques by Williams, with the confirmation by Black, supplied a reason for the prevalence of dental caries in certain situations and under recognized conditions that had long been clinically evident. At once we understood why Bonwill was right in laying stress, as he always did, upon the relation of the points of contact and the form of the interproximal spaces to dental caries, and with him many of his predecessors and successors who shared like views, down to Black's complete and orderly recognition of these laws in operative procedures. Yet none knew exactly how or why, or fully understood the *modus operandi* of this pathologic process until the gelatinoid protection of bacteria in their first attack upon tooth structure was made plain.

For some time, those who have kept pace with the advance of both bacteriology and pathology in the broader fields of the study of disease have been dissatisfied with the local limitation that these theories and explanations prescribe. There has been a growing belief that immunity should be more widely studied from its many-sided aspects in relation to bacterial affections of the mouth, as with other anatomical divisions of the human organism—that *natural immunity,* the inherent resistance of race or species to particular forms of infection; *acquired immunity* with its subdivisions, *active* when resulting from previous attack of the disease, *acquired* if brought about by inoculation with attenuated micro-organisms as by vaccination; *passive immunity,* by injection of the blood or serum of an animal previously rendered immune, and *local immunity,* the increased resistance of a single part following previous inoculation in that region, should be given more general consideration in their possible importance; that there should be profitable appreciation of the governing principles ordinarily termed opsonins, alexins, antitoxins, agglutinins, complements, antibodies, aggressins, and other factors pertaining to "blood immunity and blood relationship," in order that the science of bacteriology of the oral cavity might be on a par with contemporaneous progress in other fields.

Talbot has boldly and patiently brought forward the constitutional causes of dental caries and called attention to certain general conditions of the body in which susceptibility to caries has been proved to be a marked feature. Dr. Kirk himself has done much by investigation and previous writings to develop many features of this aspect of the subject. Until now, however, all who have followed the reports of those whose researches chiefly related to local conditions in the mouth, and who have also kept in touch with the work of advocates of the constitutional relationship of dental caries as of primary consideration, and who in addition have known something of general study of bacteria and the principles of general pathology, have felt that the division between the two groups, each advocating the preponderance of the importance of one or

the other of these two viewpoints, was wider than it ought to be, and that a fuller explanation of the direct association of local and constitutional causes was possible. This Dr. Kirk seems to have given us when he explains for the first time the possibility of mucin precipitated by the omnipresent lactic acid serving to bind lactic-acid-producing bacteria in an agglutinated mass against the tooth surface. We know that agglutination of bacteria is of common occurrence in other situations and under various conditions in many or perhaps all parts of the body, such agglutination being a part of the process by which the bacteria lose form and outline, become motionless and are finally dissolved. All bacteriolysis (the term applied to this dissolution of bacteria) was believed to be a necessary part of agglutination, but it has been demonstrated that this can take place without bacteriolysis.

Filandro Vicentini gives the following description of the white deposit of teeth, termed *patina dentaria* or the *materies alba* of Leeuwenhoek, which in one particular is relevant to our subject. He says it is composed of two distinct layers, which have been described by Robin under the name leptothrix buccalis. The principal layer embraces the tufts or hair-like appurtenances of the growth.

Each element of the leptothrix racemosa fruitful heads embraces five appurtenances, as follows: (1) A central, slender, pale stem, containing internal parietal gemmules. (2) The sterigmata or pedicles destined to bear. (3) The sporules. The pedicles are invisible under common object glasses, being very slender and pale. The sporules are of globular form, and usually appear in six longitudinal rows. (4) A viscid substance or glair, in all probability an oozing or secretion either of the spores themselves or of the stem, covers the fruitful heads. (5) Lastly, there are a number of branching threads, forming a kind of radicular system.

The deep layer of the racemosa growth is described by the writer as composed of two distinct elements: (1) The lower "stumps," growing as the bacillus buccalis maximus of Miller, and (2) the matrix itself. In its turn, the matrix is seen to be composed of two elements, namely, (*a*) the chains and bundles representing the leptothrix buccalis maxima of Miller, and (*b*) the crowded masses of cocci. (*Pract. Med. Ser.*, 1906, vol. ix, p. 160.)

The writer seems clear in his description of everything but the viscid substance or glair, which he thinks in all probability is an oozing or secretion of the spores themselves. In view of Dr. Kirk's suggestion with regard to the mucin, we find no difficulty in reasonably accounting for the presence of viscid substance. Granting the truth of Dr. Kirk's explanation—which in justice must be done until it is disproved—we find that he has brought to a single and exactly determined meeting-point the theories of those who lay great stress upon local conditions and of other authors who have championed the cause of constitutional disorders; with perfect simplicity we are now given to understand how acidity due to the fermentation of collections upon unclean and uncleansing surfaces is sufficient to cause precipitation of mucin to inclose bacteria and hold them upon roughened and imperfect, or protected, unexposed surfaces in that immediate locality, after which the remaining process of caries is easily comprehended.

On the other hand, in acidosis it is well understood that there is acid intoxication of the body in the final metabolic transformation of proteids, with the production of ammonia, urea, creatinin, and other nitrogenous substances. The excess of acid must be at least partly neutralized by an alkaline basis in the blood tissues and by ammonia. Failure on account of decreased alkalinity of the blood to effect sufficient neutralization gives rise to certain well-recognized symptoms and the urine becomes highly acid—usually iodol from intestinal fermentation leads to the presence of excess of indican in the urine. With both local and general excess of acid in the oral secretions thus accounted for, we

have at once opened up to us a complete pathologic understanding of the inseparable laws that govern the anatomic, physiologic, chemic, bacteriologic, and pathologic principles which render futile an attempt to isolate a single part in accounting for its morbid states. As usually happens when a new thought in science is brought forward as a complete entity, there spring up various claimants to the honor of its discovery. Naturally, there may be many who have long known that mucin was precipitated in the presence of acid; the local and constitutional causes of hyperacidity are matters of common knowledge—but, so far as I can learn, to Dr. Kirk belongs the honor of having brought these variously known facts together in such a manner as to work out what appears to us now to be a complete and perfect solution of the basal principles of the rationale of dental caries.

The possible extension of the value of the suggestion of mucin precipitation in the mouth is almost limitless. One finds the thick-coated tongue, pathognomic of gastro-intestinal disturbances, readily accounted for through acid intoxication and the lodgment of bacteria upon the tongue surface in this glutinous coating. Other conditions of the buccal mucous membrane are also more readily understood in this light. Ready explanation for tonsillitis is afforded through a sealing-up of the bacteria in the tonsillar crypts—and thus one might continue to enumerate disorders relief for which is promised through this simple avenue, leading toward better treatment for mouth and throat diseases.

Dr. J. Bethune Stein. I do not know that I can say much regarding the question of immunity to dental caries, for the writer of the paper, which unfortunately I had not the opportunity of seeing or hearing before this evening, has presented the subject in a brilliant way, especially in relation to the development of the micro-organisms underneath the so-called plaques. One point which was not brought out as clearly as it might have been is the question of symbiotic phenomena—the aerobic and anaerobic micro-organisms living and thriving together in the mouth.

We used to look upon caries of the teeth as produced by the aerobic micro-organisms, but that is not the fact; it is due to the anaerobic micro-organisms. The anaerobic micro-organisms, which have been called the micro-aerophile micro-organisms, live—among and through the activity and development of the micro-organisms which derive their oxygen from the air—on combinations of matter in the buccal cavity, and there cause fermentation and putrefaction, and Herter has shown that these same organisms flourish better when there is a derangement of the alimentary canal. Thus the work of Herter confirms bacteriologically what Dr. Kirk said this evening. The anaerobes have a better opportunity to flourish among the aerobes than when the former live alone. In the producing of fermentation the anaerobes are the main cause, but it has not been conclusively shown that the anaerobes are engaged in butyric acid formation.

When there is an abundance of protein and especially carbohydrate material in the mouth about the teeth, there is a great chance for these micro-organisms to flourish, through their symbiosis, and to thus produce those chemical substances which destroy the enamel; and finally, pathological changes in the alimentary canal tend to enhance those conditions which are favorable to bacterial development in the mouth.

Dr. H. C. Ferris. I have enjoyed this paper of Professor Kirk's principally because of the lucid manner in which he has presented, from a sea of material, those points that have appeared the most important in all the research work upon this subject, and we are greatly indebted to him for the advanced thought he has given us.

What little work I have done in this field has led me to believe that the entire subject is attacked upon a wrong basis. In their anxiety to come at a reasonable solution of the pathological states that exist in the oral cavity, our investigators have not endeavored to establish a normal state of the chemical, physiological,

and biological conditions, but have rather taken up the subject from the disease standpoint. It is my belief that we should establish the normal averages and the physiological limits before undertaking these problems of pathology.

In the scientific investigation of the properties of urine, blood, and feces, scientific men the world over have first studied these secretions from healthy or normal men, and after a number of investigations have established a table of averaged percentages and physiological limits, which becomes a standard for the future study of sick men.

One subject immune to dental caries, with a normal occlusion of his teeth, a normal urine, blood, and feces analysis, will give more information in our particular field of investigation than a thousand cases taken without consideration of their physical condition. An average of one hundred such cases would establish a firm scientific basis for our future study. Until this has been accomplished we shall continue to work in the dark.

It is impossible, in the light of the investigation of today, to accept anything but the theory of environment as the cause of caries; but if this environment be studied as if it were independent of the physical organism of the whole alimentary canal, I believe it to be incorrect.

Previous writers speak of immune periods of life, as if the oral cavity were an organ apart from the rest of the organism, when we can readily demonstrate that any stomach or intestinal disturbance would change the chemical balance of the saliva in twenty-four hours, and if this chemical balance should change, we thereby alter the environment in which the teeth are living. If this change is perpetuated from an acute to a chronic lesion the chemical balance of the saliva will remain altered, and on this altered secretion or environment the physiological function will also be disturbed, and tend to perpetuate the lesion in the distant region by disturbing the first chemical change undergone by carbohydrates and albuminoid food.

I agree with Professor Kirk that early dietetic consideration has a most important bearing upon this subject, but I believe that the conditions which appear to favor caries at this age are referable more to the indigestible state in which these foods reach the stomach and intestines than to any local condition, principally the decomposition of fermentation and putrefaction in the lower ileum and colon, and its reabsorbed product.

Proceeding upon another premise, that the disease has originated in the oral cavity and that this abnormal balance of the chemistry of the saliva has been accomplished by some local irritating cause, alveolar abscess, etc., which has produced a morbid action in the mucous or salivary glands, we would then interfere with the physiological action of the oral secretion primarily, destroying its function upon all carbohydrates and many proteid substances—which in its turn prevents further liquefaction of these foods for absorption by the blood.

To prove this assertion, starch globules are detected in varying quantities in the feces. Other parts of this starch, in undergoing fermentative decomposition, form mainly lactic, acetic, and butyric acid, etc., and putrefaction of proteids forms products such as indol and skatol, which are absorbed by the circulation and become irritants to the liver and kidney, producing a *circulus vitiosus,* which includes the blood supply to the salivary glands and the modified saliva, controlling the quantity of ptyalin and mucin. Fermentation of carbohydrates in the intestinal tract increases the acidity, while putrefaction of the albuminoids increases the alkalinity of the saliva.

The essayist has explained away our belief in the antiseptic properties of the saliva. I am not so ready to accept his view, because the physiological action of this secretion is meagerly understood. It does not seem reasonable that instinct in child life would cause a child to place his finger in his mouth, when injured, if it were not nature's protector against infection.

From a physiological standpoint, the essayist's statement that phagocytosis may be stimulated by the chemical prop-

erties of the saliva, I believe difficult to prove. There is, however, a physiological action which takes place between the albumin of the blood and the ptyalin of the saliva which develops a viscid, sticky substance, or chemical combination of the glucosamin and chondrosin groups, which are chemical products preceding the formation of dextrin.

We are aware that bacteria grow poorly in viscid substances in high percentages of their density, and concentration of the dextrin or sugar solution controls the growth of the lower organisms to a marked degree, which principle is used in the canning of fruits; and in nature we run up the scale until we reach honey, in the animal kingdom, and from pitches to gum arabic in the vegetable kingdom. All of these products in high concentration constitute the poorest mediums for bacteriological growth.

By exposing to the air any external wound covered with saliva, the water is evaporated, which increases the density of the sugar product and reduces its value as a culture medium for bacteria, thereby giving protection to the injured part. The percentage of this product and its control of the bacterial development would depend upon the environment, the percentage of bacteria present, or the amount of ptyalin in the saliva. To carry out this thought, no mouth which I have examined full of carious teeth presents saliva with the normal amount of ptyalin present, therefore this physiological action upon the albumin or starch tending to produce dextrin would be reduced, and as Dr. Kirk has pointed out, the mucin is precipitated, owing to the development of lactic acid as a result of this condition.

That the normal presence of dextrin should control the growth of bacteria in the oral cavity is a question to be determined, and while this product would not be considered antiseptic, its physiological action in accomplishing this result should be acknowledged.

Dr. G. W. Weld. I have here three models, two of which I presented before the National Dental Association in Boston a year ago last July. The paper was published in the Cosmos, and entitled "The Characteristics of Decalcified Tissue in Two Complete Sets of Human Teeth Free from Caries." [See Cosmos, vol. li, page 73.]

I hold in my hand the model of the teeth of a gentleman fifty-two years of age, who has thirty-two teeth in his mouth. There is not a carious spot in any of his thirty-two teeth. These I have denominated hard teeth, and they are so marked.

Here I have a model of the teeth of a gentleman who is an actor, forty-one years of age—these teeth I call soft. He also has thirty-two teeth in his mouth; they are completely worn down, almost to the quick, and yet for forty-one years, or, rather, since the eruption of the permanent teeth, they have been perfectly immune from caries.

Here I have a third case which came to my hands a few days ago, of a man of forty-six years—hard teeth apparently. He has thirty-two teeth, but has never had one filled.

Now, when we come to examine these models, there are one or two questions which come to our minds, and perhaps the first is, Is it the presence of vital energy inherent in the tooth structure, or is it the absence of precipitation of mucin and of bacterial plaques, that accounts for the immunity?

There is one particular thing in relation of two of the models, and that is that they confirm Dr. Black in one or two of his conclusions: First, that the differences in the density of the human teeth, that is, the percentage of calcium salts in the teeth, have no influence upon their liability to decay; also that, because of the absence of pyorrhea alveolaris in both cases, there is no basis whatever for the supposition that persons who have dense teeth are more liable to pyorrhea alveolaris than those who have teeth that are less dense.

These models perhaps do not bear very closely on our subject, but they are interesting, and I will leave them here for anyone to examine who so desires.

Dr. S. G. Perry. I did not have the pleasure of reading the paper, and being

neither an experimenter nor special investigator, I do not feel myself competent to discuss offhand such an excellent paper.

I am more than delighted with Dr. Williams' discussion, and it is a very great delight to me that Dr. Kirk has put the matter in such a clear and comprehensive light. I am very much gratified at the results of the evening.

Dr. A. R. Starr. Like Dr. Perry, I have not made many investigations, and only know what I have heard from others. I greatly appreciate the paper; it is highly edifying, and I believe most of the grounds taken by Dr. Kirk are absolutely correct. We all know that teeth depend greatly upon environment, so far as their predisposition to decay is concerned, and I believe decay is so seldom found without those bacterial plaques that if we should find anything to eliminate their formation, we will be successful in eliminating caries.

Dr. G. A. Mills. This subject is to me an intensely interesting one, although I do not claim to be a microscopist or an investigator; but I have been a good listener for about fifty-nine years, and I am greatly pleased to see two men here, Dr. Williams and Dr. Kirk, so well agreed as they are. It is so uncommon to see scientific men in agreement.

I was particularly pleased, too, with Dr. Stein's remarks; he brought out a very valuable suggestion relative to the formative processes in the mouth.

The question is one of nutrition; that is what is going to settle the question—nutrition or non-nutrition. Our dear old friend Atkinson made this statement: "What is nutrition? It is something that feeds—and it feeds the tissues." The great trouble has arisen with all human nature to this extent, which agrees very largely with our friend Dr. Talbot of Chicago—we have been giving so much nutrient substance that we have destroyed the possibilities of normal function. The foundation of this whole business, to which we must again gravitate, is recognizing causes we have never properly recognized. We are discussing nothing but secondary causes. We are limited because of the fact that we will not recognize first causes. Dr. Talbot has laid down a principle that I challenge any man to disprove. It is the foundation of all we talk about: *We must consider the soil in which our teeth grow.* That is the primary object of all our work. I do not expect that we shall reach perfection, but we shall better the conditions in the future. That is what we are after, something better than the conditions which we have.

Speaking of Dr. Miller, I heard him on this problem the last time he spoke here, and I think it was also the first time I had heard him. The discussion he brought out was remarkable. He wound up with this remark: "I have to admit this—that if the teeth could be kept clean, there would be very much less decay." That is a very simple remark—from a practical standpoint that of course is our work; but I am looking to a better condition of the constructive forces in nature by trying to go back as near as we can to the primary conditions, and get a better development of teeth by increasing a better condition of the soil in which teeth grow.

Dr. S. C. G. Watkins, Montclair, N. J. I cannot let the opportunity pass without saying that I have been intensely interested in everything that has been said tonight. I have enjoyed Dr. Kirk and Dr. Williams immensely, but in regard to the prevention of caries, it seems to me there is one thing that we all have overlooked, and that is the *use* of the teeth—Fletcherism, mastication. It seems to me that of all the things in the world, in regard to the decay of the teeth, that one thing—mastication—will do more to prevent it than any six others, I do not care what they are. Use them thoroughly with the proper food, and there will be much less necessity of brushing, because the proper food will brush them to a certain extent, and give healthy gums, and bring good healthy blood into the teeth, which is food for the teeth, and which will prevent decay.

Dr. W. W. Walker. I want to offer a vote of thanks to our fellow member, Dr. Kirk, for coming here tonight and

giving this delightful talk on the subject, about which we know so little.

The motion was unanimously carried.

Dr. KIRK (closing the discussion). I want to first thank the society for the very great patience which they have manifested in listening to a paper which is somewhat technical, and I want to thank them all the more because of the revelation that Dr. Walker has made, that you have listened to it without knowing anything at all about the subject. I do not quite believe that; I know you have all given very close attention to this problem which is interesting all of us, the question of the treatment and prophylaxis of dental caries. We are constantly getting a little nearer to the truth—one step at a time; and the man who is making clinical observations, my friend the self-styled practical man, with whom I have had several discussions, as well as the scientific investigator, is bringing important testimony forward, which I think in the course of time will enable us to solve the problem in such a way that we will be able to actually prevent and cure dental caries.

I want to thank Dr. Williams for helping to set me straight in your minds. I think that is the office of a friend. His epitome of my attitude in this matter, about what I have been trying to do, is very helpful indeed, and I appreciate it very fully; and I wish to emphasize his idea that while I have brought a number of suggestions to you for consideration, they stand only upon hearsay evidence. You have heard me say it, but I shall not feel happy or satisfied until some of you have taken up this work in an experimental way, and cross-test the suggestions I have made, by careful laboratory or clinical experiment.

Another question just touched upon by Dr. Williams raised a very important point, viz, whether the treatment of this condition should be by alkaline or by acid dentifrices. He raised that question when he spoke of the particularly good teeth of the inhabitants of the island of Sicily, where they constantly munch lemons. I should say that where acids are constantly taken into the mouth, as where the habit of eating acid fruit is indulged in, we get a clearing of the saliva of its mucous element by precipitation of mucin, just as we do from the acids poured into the mouth by the acid secretions of certain disordered mucous glands. So the constant use of the lemon would disturb the cycle of factors that is necessary to produce the conditions under which decay can take place.

I did not touch upon a very broad question, and a very important factor of this whole matter which was referred to by Dr. Stein, the question of symbiosis, that modifies the activities of what we call the oral flora. Not only the question of symbiosis, but also the question of whether these organisms are capable of developing in the presence or absence of oxygen or in an acid or alkaline medium, are all important factors in the struggle which is constantly going on in the variety of forms which constitute the oral flora. Symbiosis undoubtedly has a modifying effect in determining the type of bacteria that will survive in the salivary culture media.

I trust Dr. Ferris will be permitted to write out the remarks he would have made, because he has given intelligent attention to this subject, and I shall feel the discussion would be incomplete without the remarks he would have given us under other circumstances.

I would like to examine carefully the casts of cases presented by Dr. Weld. Generally speaking, they are typical cases of immunity to dental caries; but the question arises as to the method by which this immunity has been brought about. He has demonstrated one point for which I contended in the paper, when he shows the models of one case where he says the teeth are hard and dense, and another where the teeth are of a less densely calcified character; and yet in both cases there is absence of caries or immunity from caries, which shows that neither the structure nor the function nor the composition nor the form of the teeth has anything to do with the cause of dental caries. A loosely calcified tooth will not decay, nor will a densely calcified tooth decay in an environment

which does not satisfy the conditions of decay, and any tooth will decay in an environment where the surrounding medium is such as will support the vital activities of caries-producing fungi and determine their localization.

Dr. Mills has hit the nail on the head absolutely. It is an intricate question, a question of how this human machine works—that is the problem at the bottom of it all. I do not know how to put that question before you; it is one of the most complex problems we have. Every man must have a point of departure—some line of least resistance—along which his mind may go in the study of this subject. For myself I may say the greatest illumination I have had in the study of bodily nutrition has come from solving the difficulties I have had to contend with in puzzling out the vagaries and peculiarities, and I may say the hysterical activities, of a gasoline engine. I presume in New York you all drive motor cars. Some of you may have them driven for you—that is a mistake, you should drive them yourselves. If you want an illuminating study, make up your mind that you will understand the physiology of a gasoline motor—study it scientifically, and you will learn more principles that will help you to understand this great combustion furnace—the human body—than by any other method I can suggest. If you understand the human body from the point of view of the combustion motor, and consider the human organism only as a more highly elaborated machine, not using a simple chemical compound like gasoline for its source of energy, but the very complex pabulum that we put into our several dietaries, and then study the transmutation of that source of potential into its end-products, I think you will derive a great deal of information from the study of it.

The analogies between the motor and the living body are many. We have in analogy the microbe in the motor, malnutrition, problems of indigestion, hysteria, and all sorts of insanity—everything almost that you can find in the human body. We have corrosion, erosion, and even decay.

As to the question of clean teeth, it is true that clean teeth will not decay, but from a biological standpoint I ask, Why should we have to clean them—why should they not be clean naturally? We hear the simile, "Teeth as clean as any hound's." I never knew a hound yet that used a tooth-brush or had his teeth rubbed with pumice and a stick. I am not speaking of all hounds, because some of them have dental diseases, too, but I mean the normal hound.

I traveled in Europe with a man who told me he had not used a tooth-brush for weeks. He had a breath as sweet and pure as that of the newborn infant. He did not need to clean his teeth. He said "I do it, because it is the fashion." He had thirty-two teeth, perfectly clean. Why should we not all have self-cleansing teeth? That is the question we need to solve.

As to Fletcherism, it is incidentally a mode of cleaning the teeth. It is also one of the steps toward a better nutrition, yet the very best evidence I can offer you with regard to the imperfections of Fletcherism in its entirety, or as a protection against destruction of tooth structure, is afforded by the denture of Horace Fletcher himself. I think you have seen noted as one of his innumerable stunts the number of hours he has sat in the chair of his dentist, and gone to sleep while he was being operated on, etc. It is anything but a typically perfect denture, and there are reasons for it—Fletcherism needs modification. It has much of good in it, but it is not the whole story.

I wish to thank you for your attention, and I offer my special thanks to those who have discussed the paper.

Adjournment.

HERBERT L. WHEELER, *Sec'y.*

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

Tenth Meeting—Paris, March 25-27, 1910.

(Continued from page 679.)

PRESIDENT'S ADDRESS.

Mr. W. B. PATERSON, president of the International Dental Federation, then delivered the following address:

My honored confrères,—It is with great timidity that I present myself to you today as president of the International Dental Federation. When I think of the eminent men who have preceded me in this difficult and important office, I am almost paralyzed at the thought of my shortcoming. I am certainly under obligation to do everything in my power to follow their example in order to justify the confidence you have placed in me. Being an infant in this Federation, it is not for me to presume that I shall be able at all to equal these men, although I can humbly try to emulate the activity of our distinguished honorary president and the first president of the Federation, Dr. Godon, whom we regard as the father and the founder of the F. D. I., and to whom I turn for aid and guidance in the difficulties of my task as they present.

I must not fail to express myself in regard to his lamented successor in the presidential chair—a man of powerful and wide intelligence, a man who devoted himself to acquire knowledge in all its diverse forms with a zeal and interest that considerably surpassed the ordinary limits of humanity, a man whose work and whose knowledge in scientific, political, general, and social fields were equally great. Alas! Miller's brief three years of work in the interest of the F. D. I. were altogether too short for all of us. If he is no longer among us, the memory of his work and the noble ideal which he tried to realize still remain with us as a precious inheritance and an ever-powerful example for our greatest and best efforts.

As for Dr. Sauvez, our president since the death of Professor Miller, I am sure that I but voice your unanimous opinion in saying that we have admired the brilliant and eloquent discourses which he has given us during that period, and moreover that all have appreciated his tact in moderating our exuberance in character and words which sometimes savored too much of our nationality. I consider myself privileged as a friend as well as a *confrère* of Dr. Sauvez to be able to count upon his kindness and on his knowledge of men and things, and I shall always regard him as the great cosmopolitan that he is. He has one fault, however; if he will permit me to say so, he is too modest.

It remains for me to express to all of you, my *confrères,* how deeply I feel the honor which you have bestowed upon me by nominating me your president, and I wish to return you my most sincere and cordial thanks.

Coming to Paris for a reunion of the F. D. I. seems to me like coming home, for I remember that it was here—and if I am correct, not very far from this place—where the F. D. I. was founded in August 1900, as the permanent bureau and consulting committee of the international dental congresses. We owe very much to our French *confrères* for the motherly care which they lavished upon our Federation during its infancy. Without the wise diplomacy which they

have displayed at its *début* in international relations, our hopes and our ideals might easily have been destroyed, and the international foundation on the large and universally accepted basis which now underlies the dental profession might have been retarded for a long time. I also remember that it is at Paris where I first learned the significance and the purpose of the F. D. I. at an epoch at which faulty ideas existed concerning the same. It would be an old and uninteresting story to recall the past to this assembly, but it is only proper that your president should sum up in brief the rules according to which the Federation has been conducted and hopes to continue to transact business. This at all events will be a proof of my faith in the principles laid down by my predecessor in this office and justified by time and experience.

The International Dental Federation is the result of a movement which was started during the International Dental Congress of Paris in 1900 with the object of creating a readily responsive organization in order to conserve the continuity of thought and action in the intervals between the congresses, and to furnish prompt assistance in the calling together and the organizing of these congresses. It is quite evident that it has been useful in that respect, because the two international congresses of St. Louis and of Berlin have continued to maintain this organization. If another proof of the usefulness of the F. D. I. were necessary, one can find it in the proceedings of its meetings as published in the principal dental journals of all countries. Dr. Sauvez in his excellent speeches at Brussels and at Berlin, has given a *résumé* of the work of the F. D. I., its importance and its international utility as evinced by its reports and discussions on the perfecting of dental education and public dental hygiene, and the great part played by the F. D. I. in the organization of national organizations and the establishing of fraternal feelings between the members of the dental profession of the whole world.

The F. D. I. is not only an organizing body, it is also an international consulting committee, and being an assembly of the representatives of societies and dental schools of many countries it has an incontestable right to that title. Its advice is not derived from the force and authority afforded by an autocratic spirit, its value rather emanates from the reasonable and independent judgment of which the Federation has always been proud, and upon the basis of which it has always tried to reach its conclusions.

The marvelous success of the recent International Dental Congress of Berlin should have destroyed any false ideas or hesitation in regard to the F. D. I. and its work which may previously have existed in the minds of those who attended that grand reunion of the world's dentists in the magnificent Reichstag building. They must have taken home the conviction that more and more do these reunions tend not simply to enhance the value and importance of dentistry both as to science and practice in the public estimate, but also to contribute to forming ties of personal and international friendship.

As a result of the Berlin Congress we are assembled here today as a reconstituted Federation, and we are entering upon the third period of our existence. I have the fond hope, and I am sure that you share it with me, that it will be just as happy, just as prosperous, and just as useful a period as its preceding periods have been.

You will have noticed on our program the question of the constitution of commissions and their working plan. It goes without saying that the commissions are necessary for our existence as a Federation. We have lived on their work in the past to such a degree that we naturally wish to see them reconstituted. Our oldest commission, the first that was nominated by the Federation, is that on Education. Its first and only president is Dr. Brophy, and no one in the Federation has a better knowledge of the task of that commission or has worked more for it. Since the memorable reunion of that commission in the hall of Trinity College, at the University

of Cambridge, in 1901, presided over by Sir Michael Foster in the absence of the vice-chancelor, Dr. Brophy has been at the helm, and has piloted us cleverly through a sea full of dangerous cliffs. Owing to his profound knowledge of the questions of education, his strong personality, and his zeal, he merits our profound gratitude. The only means which I can suggest in order to give him a tangible proof of our appreciation of his services is to ask him to once more preside over the committee which he has so well guided. In the first and one of the most excellent and most appreciated speeches which Dr. Brophy has given in this commission, he outlined certain procedures. The commission has already wrought successfully by following some of these guiding lines, and as proof of their value several countries have adopted these guiding principles, which have helped them in elaborating the curriculum for their dental schools. The commission has not yet taken up one question—I am citing Dr. Brophy himself—namely, the methods of instruction and their perfection. Another and kindred subject, namely, the examination and comparison of dental pedagogical methods, seems to me to deserve our attention. Certainly it is of international interest.

The second commission nominated by the F. D. I. is that on Dental Hygiene, to which subsequently that on Public Dental Science was added—it dates from our meeting in Stockholm in 1902. Dr. N. S. Jenkins was its first president and displayed great activity and energy in assimilating its work to the efforts of the pioneers in dental hygiene renowned in his home country. Dr. Jenkins was succeeded by the late Professor Miller. He was followed by Dr. Lyman C. Bryan, who remained in office until he gave up dental practice.

I have already stated in my circular, and you have undoubtedly heard from Dr. Jessen, that Sweden is still at the head in dental hygiene. This has again been demonstrated by the gracious patronage accorded our permanent Commission on Hygiene by his Majesty King Gustaf. I repeat the word *permanent* Commission on Hygiene, because, as those who have attended the congress at Berlin know, it was the urgent request of the section on Hygiene that the congress decided to render the commission a permanent one and to give it the power to nominate as members all persons, even outside of the profession, who are interested in dental hygiene—an unusual power which heretofore has not been conferred upon the commissions of the F. D. I. The F. D. I. not needing to reorganize this commission, its directors and professional members having already been nominated by the congress under Professor Jessen as president, is bound to give them all possible assistance in their task.

Dentistry in its relation to public health is now a mission of most urgent importance, which will become even greater in the near future. Considering the high percentage of dental diseases already existing in the adults of our civilized countries, a percentage which is still higher amongst the children, the question of dental prophylaxis and care assumes vast proportions, and demands much more serious consideration on the part of the respective governments in regard to the needs of the poorer classes. The governments must heed the advice of the enlightened dentists, and if such advice is to be of practical utility for the state it must not be limited to a medical and dental investigation of this question, but must comprise a complete knowledge of it from the economic point of view. Where can we study practical dental economy better than in the Commission on Hygiene? There we find international efforts and results due to men who do the work of pioneers in the hygiene of schools, hospitals, and public institutions in a great many countries.

Independently of the economic side of this question, the problem as to the best method to prevent the great destruction of teeth in children belonging to the poorer classes is agitating many minds in different countries. There are other questions, such as the dental care of

charitable institutions and the extension of dental service to the army and the navy, all these being matters which deserve most complete inquiry and study from an international point of view, and in this respect we have much to learn from one another.

I can only briefly hint at the work which can be conveniently divided up between the commissions. I have alluded to the questions concerning our two oldest commissions, because I believe that they are of most urgent importance in the future. I do not intend, either, to enumerate the many items of their past work, for Dr. Sauvez in his addresses at Amsterdam and Brussels has already treated this subject so completely that there is nothing left for me to say.

In finishing my remarks concerning these commissions, however, I wish to remind you that the work of the Commission on Dental Terminology remains still unfinished. Its president, Dr. Grevers, has presented us at intervals with some short reports, but the final report is still outstanding. The task is a difficult and necessarily a slow one, but it demands our efforts, because it is of an essentially international character. The particular difficulties which it presents lead me to propose that we borrow the plan of our permanent Commission on Dental Hygiene, and make an effort to solicit and engage the services of scholars outside of our profession. A little instance which shows the importance of this question occurred the other day in my country. A distinguished Greek scholar of the University of Oxford questioned the correctness of the etymology of the word "orthodontia," so commonly employed by all dentists, and it seems that it should be substituted by the term "orthodontics." Another task which we could assign to a similar committee of scholars would be to revise and to harmonize the publication of our important resolutions in the official languages of the Federation. Even our rules which in the past have been subjects of deep thought are not free from faulty expressions and serious obscurities owing to the lack of revision by a committee such as I have indicated.

As to the delicate question of the admission of dentists to the international medical congresses or their exclusion, arising over the much-to-be-regretted act of the committee on organization of the Medical Congress at Lisbon, the F. D. I. at its last session at Berlin adopted a resolution deciding to communicate with the general secretary of the International Congress of Medicine at Budapest, with the request to present such resolution to the permanent bureau of that congress. This has been done, and I am in a position to say upon the authority of one of the English secretaries of that congress and connected with that bureau, that this resolution is being examined at this very time, at the Easter session of that bureau at The Hague. Awaiting their decision, I note with interest the nomination by the Medical Congress of a bureau on a quite similar basis to that of our Federation, and for purposes almost identical.

A special duty behooves the Executive Council of the F. D. I. at this session: It has to award the international Miller prize intended for "persons who have rendered the most eminent services to dentistry." It is not necessary to recall the details of the regulations for that prize. They are given in acticle 2, paragraph *e,* of our rules and regulations, copies of which have been mailed to you or can be found on this table. I would only remark that the terms of clause 3 are very broad. There is no specification of time or of services. As I have stated in my circular letter, and as I wish to repeat, I have confidence that the members of the Council will fulfil that duty with full consciousness of its high significance and its great importance. A well-made first selection will raise the value of the prize in the eyes of the dental world, and it is to be hoped that unanimity may crown our efforts in this selection.

Another matter devolving upon the Federation is the question of the organization of the International Dental Con-

gress of 1914. We must take measures to commence the work of preparation for that congress. Speaking on behalf of my country, I would say that the British Dental Association has put its offices at the disposal of the organization committee. The committee has not yet been nominated so far as Great Britain is concerned, but it will soon be nominated, I know. As no decision has been made concerning the power of the organization committee to be nominated by the inviting country and the Federation, it will not be possible for us to nominate our share of members as provided by article 16 of our rules and regulations. This should not, however, prevent our making a preliminary investigation into certain questions concerning the congress. For instance I mention only one —the acceptance of papers, the measures in regard to papers to be read in the different sections, the restrictions as to their number, their relative value in regard to discussions which should be prepared beforehand. We could also consider the great difficulties as to languages which present themselves at all international congresses, with a view toward improving our manner of procedure in regard to our own individual specialty.

Finally, I would recommend for your consideration the question of finances, in which our treasurer is chiefly interested, also the prosperity and the progress of our Federation. I must, however, not infringe upon the domain of Dr. Rosenthal in regard to our sources of income. I have in mind the idea of making the F. D. I. easily accessible to members of national dental federations and to men enjoying a good reputation in their own countries. The Executive Council is more or less a limited body as far as its constitution and the number of its members are concerned, but the commissions—and these, after all, are the most attractive part of our Federation—are capable of great extension in regard to their usefulness as well as the number of their members.

The rules concerning dues of the members of the F. D. I. and the Executive Council, which have remained the same as when these bodies were established, need not necessarily be regarded as immutable, if in our opinion the F. D. I. might gain by a change.

In conclusion, a word of explanation and excuse is called for on behalf of the Executive Council, for its having hesitated in distributing the circular letter by which this reunion was called together. I acknowledge that one month is too short under any condition; but for the members of the Executive Council living in the more distant parts of the world, such as Australia, America, and Japan, it is entirely insufficient. It had been hoped that some notice would be given at the meeting of the F. D. I. at Berlin in August last that the next meeting would take place at Paris at Easter 1910. We hoped at least for such announcement as would permit our members to make their dispositions in advance. There were great initial difficulties such as confront each new Executive Council, its members living great distances apart, and the place and time of the reunion—at Paris, where the disasters of the flood, which assumed terrific proportions, seemed to menace all chances of a reunion—in short, everything conspired to cause us difficulties and delay. Nevertheless we present our most humble apologies, which are specially due to our colleagues who live far away. I make these excuses in all sincerity, and I hope that you will consider them sufficient for the reasons which I have given, and that you will accept them in the spirit in which they have been made.

Professor Dastre thanked Mr. Paterson for his interesting address.

The foreign delegates then one after another spoke in the alphabetical order of the names of the countries they represented.

Dr. Jessen of Strassburg said: In the name of my German *confrères,* I have the honor to convey to you the most cordial salutations and best wishes for our common work. Here in Paris ten years ago the F. D. I. was founded, and we know that there are some men

among us who both helped in laying the foundations and have presided over and directed its sessions. Behind us lie ten years of work full of results. Our profession has made grand progress throughout the whole world. We hold an honorable place in science, as the last International Congress at Berlin has clearly demonstrated, the government having taken in that congress a very much greater part than it had ever before. The F. D. I. rendered great service in the organization of that congress, for which it deserves the gratitude of the dentists of the whole world. I am especially grateful to the F. D. I. for having given the Commission on Hygiene such a large field of activity, and for having decided to take up at this present meeting the mission and the aim which that commission pursues in order that we may work together for the prosperity of our profession and the welfare of all humanity.

Dr. KIRK of Philadelphia, in the name of the dentists of the United States of America, conveyed the salutations of his *confrères*. He regretted that his country was so little represented at this meeting, which was attributable to the time chosen for the meeting. Nevertheless, he said, though the American delegates have not appeared in full number, the American dentists are in spirit assembled here in Paris with their colleagues. The F. D. I. will certainly hear with pleasure that its activity is making itself felt in America, and that its benefits have already widely spread there, for a very careful inquiry has demonstrated the great necessity for organizing everywhere public dental service such as is indicated by the Commission on Hygiene.

Mr. MUMMERY of London said: In the name of my *confrères* of Great Britain I rise to convey our salutations to the members of the F. D. I. We have been disunited, but we have risen again like the phœnix in the fable, and I hope that we shall live again with new energy. We have lost some of our plumage in the test, but new feathers will grow, and we are delighted to revive in the magnificent city of Paris, where we have already had such a hospitable reception. We shall have lots to do in this short session, and we hope that our entire activity will be concentrated to the due fulfilment of our different tasks.

Mr. WILLIAMS, delegate of the Australian government, thanked the French F. D. N. in the name of the Australian government and of his *confrères*. Under instructions from his government to make an investigation on dental instruction, he was traveling over Europe, and was certain to derive great profit from his journey. Australia is a great country which is not yet fully populated. At the last national dental congress only Australian dentists were present; but he hoped that at the next national congress, which is to be held at Brisbane in October, the French dentists would also be represented.

Professor DASTRE thanked Mr. Williams for the information concerning his mission and the Brisbane Congress.

Dr. E. ROSENTHAL of Brussels spoke as follows: In the name of the Belgian F. D. N. I would thank our French *confrères* for the amiable and hospitable reception which they have tendered to all the Belgian *confrères* attending this present meeting of the F. D. I. We Belgians consider this reception quite natural, on account of the sympathy and affection which we have always found in France, so much so that we have lost the faculty of wondering about it. Since the last report which I had the pleasure of presenting to the F. D. I. concerning the position of dental science in Belgium, nothing has changed as yet concerning dental instruction and dental diplomas. The intense activity, however, in exercise in the entire Belgian dental world and its affiliated circles gives proof of initiative and vitality. The Belgian F. D. N. no longer knows any barriers, and, widening the limits of its ambition, is organizing for July next a national gathering. This manifestation, highly significant and unprecedented with us, will be given under the patronage of the government and under the honorary presidency of Baron Descamp, minister of science and art. It would seem from

the official indorsement which our efforts have received, that the authorities are anxious to form an opinion whether we are able to do useful and scientific work. We shall do everything to justify the confidence placed in us, but as an organized profession we are still young in Belgium, and we are making a strong and hearty appeal not only to all our French *confrères,* but to all the dentists that they may help in lending our congress additional splendor, first by their attendance, and second by papers and technical demonstrations. This is a problem which passes beyond our borders, and the conservation of the autonomy of our profession in Belgium cannot but exert a reflex influence on the entire dental world. Therefore, attend the session at Brussels from July 24th to 29th, and you will surely be doubly welcome.

Not limiting its activity to this congress, the Belgian F. D. N. is organizing a section on Hygiene for the International Exhibition, which, by way of parenthesis, promises to be a most splendid and important one. In a space assigned by the government an ideal dental office will be exhibited. The committee in charge of this exhibit have worked most devotedly, and everything promises that their success will be at once instructive and protective to the public, constituting an object lesson and forcing all dentists to bring their offices up to the modern standard. Finally our Belgian dental journal, the organ of the Belgian F. D. N., is continually improving. It has grown not only in volume but also in value, and from all cities the most encouraging comments have been received.

From this short abstract you may see that Belgium is following the example which you have given her, and that we hope to attain the result which we ambitiously strive for—that is, the establishment of complete progressive integral professional instruction, imbued with the pure scientific spirit, also comprising a great deal of manual and technical instruction—which is and will be the foundation of our science whatever one may say or do.

Professor Dastre responded that it was not necessary to remark that the French are in ideal communion with the Belgians.

Dr. Christensen of Copenhagen, representing the Danish dentists, said: I would convey our best compliments to the French dentists, and also as a member of the Superior Sanitary Council of Denmark I have been commissioned to express to the F. D. I. our best salutations and wishes. The Danish government is familiar with the efforts of the F. D. I., and is taking a most active interest in its work. It is convinced of the importance of dental societies to the public health and to social questions. When at the Berlin Congress the Commission on Hygiene was enlarged, and twenty committees in the various countries were nominated, Denmark was the first country to take up these efforts and to put them into realization, and in Copenhagen the Danish Society for the Care of Children's Teeth has been founded. People of all walks in life, medical men and ministers, have become members of that society. Institutions have been founded to extend our activity over all parts of the country. Our example has been followed immediately by Sweden, Holland, and Finland. I wish to express to you the hope that under the exalted protection of the King of Sweden our efforts will take root in all the civilized countries and will benefit all humanity.

Dr. Aguilar of Madrid: It is with great pleasure that I speak in the name of the Spanish delegation. At these reunions the time always seems too short. Here we receive inspiration for our work. It is superfluous to say that we always come back with great pleasure to Paris, the cradle of the F. D. I.

Dr. Van der Hoeven, Holland: In the name of the Netherlands Dental Association and the Netherlands Dentists' Society, I have the honor to convey to you cordial greetings. Two events, as you will learn with interest, recently have come to pass in Holland. The first is the erection of a new dental school at Utrecht, which is almost completed and

will be fitted with everything necessary for good dental instruction, and which will accommodate about 150 students. The second important event is that the national committee on Hygiene of the F. D. I. has founded a society to combat the effects of dental caries among the people. The national committee has succeeded in obtaining the assistance of some high personages who have been willing to lend their names in the propaganda for this work in Holland. I thank the French F. D. N. for its excellent provision for our reception, and hope that this meeting of the F. D. I. will be as useful as the former ones have been.

Dr. GUERINI of Naples: In the name of the Italian *confrères,* and in particular of the Sanitary Council of the City and Province of Naples, I bring to you our salutations and best wishes for the work of this meeting. The Italians fully recognize what the F. D. I. has done for the welfare of the profession, for they all aspire to the highest ideals. Unfortunately we have not done anything yet, for a dental war is being waged among us. Continually new projects for dental instruction are offered which are useless, particularly on account of ministerial changes and the indolence of the committees. I am bringing you this unfavorable news, hoping that finally public opinion may be aroused so that something may be done and that next year my communications may be more favorable.

Dr. A. LENHARDTSON of Stockholm thanked the F. D. N. for their reception and conveyed the greetings of the Swedish dentists, with their wishes for a prosperous future for the F. D. I.

Dr. SIFFRE of Paris, speaking on behalf of the local committee: In the name of the Odontotechnic Association I extend our welcome to the foreign representatives. I thank Dr. Fr. Jean for having secured such a large attendance. Though France has been foster mother to dental science, with her Fauchard, many other germs have grown abroad. We must all be united for the welfare of our profession, and in France we have the advantage of a well-organized dental profession. Besides our mechanical skill, we have a dental science which is well represented today by one of its most prominent expounders. We take pleasure in receiving our foreign guests in the spirit of most sincere cosmopolitanism.

M. BARRIÉ of Paris, speaking on behalf of the Horace Wells Committee: Our president, M. Quincerot, who is indisposed, has asked me as general secretary to invite you to attend the unveiling of the monument to Horace Wells which will take place on Sunday, 10.30 A.M., at the Place des États-Unis. Other speakers, more authoritative than I—Professor Dastre, member of the Institute of the Academy of Medicine, and Dr. Jenkins, president of the American Dental Club—will tell you of the life, the work, and the great discovery of our illustrious *confrère,* namely, that of surgical anesthesia. Horace Wells richly deserves the title which has been given to him, namely, "benefactor of humanity." For reasons of related scientific work we have associated the name of Paul Bert, by placing the medallion of this great scientist on the base of the monument.

In order to perpetuate the memory of this great man, Horace Wells, some French *confrères*—with no other title to do so except their honorable professional standing—formed an initiative committee, and thanks to the assistance which they have received from the public authorities, ministers, scholars, and their *confrères* at home and abroad, they have been able to complete the work undertaken. The French dentists have in this way given their *confrères* in America a new proof of esteem and sympathy, and have done honor to themselves by glorifying one of their profession.

PROFESSOR DASTRE'S ADDRESS.

Professor DASTRE then delivered the following address: A letter from the Minister of Public Instruction, dated March 15th instant, has commissioned me to represent him officially at this ceremony—"as a proof of the interest

which your efforts inspire." I feel highly honored by this commission, for two reasons: First, because it brings me before the best-qualified members of the foreign dental federations, and gives me an opportunity to welcome them with the great respect which they deserve; and second, because this commission brings me in contact with the French committee and with the national association, which merits no less regard. Gentlemen, this ministerial commission, and this reunion in this Richelieu amphitheater of this Sorbonne, which since the days of Richelieu has been entirely renovated, are not without important significance. They are a sign of your growing activity. You have entered today the precincts of the alma mater, mother of liberal professions, who formerly ignored you; you have triumphed over the prejudice and the inertia of our old university. You will discuss and resolve the problem which is occupying this university so much, and which is confronting it from all sides, namely, the preparation of youth for active professional life. The great difficulty of this work of preparation consists in duly considering the following two elements: First, the general education, which forms the basis; second, technical apprenticeship, which goes to make professional effectiveness. This you have wonderfully succeeded in doing in the organization of your schools, and for that reason you have recommended yourself to the attention of the Minister of Public Instruction, who represents the government. The solution of the problem which is confronting France concerning the practice of dentistry is, however, not yet completely and definitely achieved. Excellent dental schools are giving instruction; the government, however, controls only one portion of this instruction, that which concerns general education. It has instituted examinations in order to ascertain the anatomical and medical knowledge which is indispensable, but it does not demand anything on the technical and professional side. It leaves this question to the dental schools, and these give a diploma without sanction.

The government, therefore, at most, exercises but half control. It is surely not enough to simply watch over the general education, for we are dealing here with a profession which must at once be scholarly and artistic; in no other profession, in fact, are dexterity and manual ability bordering on virtuososhiip in mechanical skill developed to such an extent. Must, then, this situation be modified? This indifference of the government—is it good or evil? To what degree should the technical instruction in your schools, which is open at the stage of apprenticeship be associated with work done in the private office of a preceptor? These are questions which still divide you. Partly they have been resolved by regulation, but partly they remain still open. Your foreign *confrères,* by making you familiar with their opinions and with the solutions which have been adopted in their respective countries, will aid you in determining your own position. Your permanent international committee is confronted with still other problems. Nothing that concerns dental science, instruction, public hygiene, the question of professional ethics, etc., escapes its consideration. For that reason the annual reunion of this committee which you call the International Dental Federation is an event that marks the internal life of your honorable and useful profession, but it is also an event the interest in which is not limited to your profession—for which this meeting is sufficient proof. Your work, which in some respects concerns the public powers, also interests the other numerous professions kindred to your own—namely, medicine and its practitioners, with whom you have many points of contact and some surfaces of friction; it interests the practitioners of surgery, of which you are a branch; it interests, finally, permit me to say, the physiologists, of whom I am one. Like us, gentlemen, you handle poisons; like us you practice anesthesia (which, moreover, you discovered)—medical men do the same. That privilege is attached to your diploma, and it is for that reason some desire that no dentist should be

allowed to practice without having obtained the diploma of a doctor of medicine. But so we physiologists might maintain that you are doing the work of a physiologist, and from that it were only a step to demanding from the dentist that he should have the certificate in physiology which is awarded in this building of the Sorbonne by the faculty of Science.

But let us cease to exaggerate, and let me stress other points which connect you more closely with physiology. I can never forget that my teacher and predecessor, the famous physiologist Paul Bert, welcomed the first symptoms of the revolution which you accomplished in 1879—and which has made of you the strong organization of today, uniting by professional ties the formerly dispersed elements that had no supervision or uniform discipline. He welcomed the first steps toward this Federation whose mature development we witness today. International federation was indeed a factor in the founding of the Dental School in 1879, the annual opening meeting of which school Paul Bert five years later presided over, in 1884; and what did he say? In his attractive manner, in an address illustrated by anecdotes, he briefly voiced the following: "Be yourself. Do not neglect technics, the essential part, which in medical practice is only an accessory. Your profession is difficult, delicate, full of detail; you possess a special ingenious instrumentation whose handling requires a dexterity which cannot be acquired at any age. Devote to that object your years of preparation." I must not forget, gentlemen, that I am speaking here before a general staff which knows how to combine general science with technical ability; but one cannot expect as much from all those who practice dentistry, the army of which you are the generals, from the pupils whom you instruct, from the apprentices who are preparing for the profession. They must be technicians.

As for medicine, dentists surely must know some parts of it, as for instance the various chapters of what today is called stomatology. You must know the relationship of general disease to dental affections, you must co-operate with the surgeon in numerous cases, and intervene in the treatment of affections originating from alterations of the dental system, sympathetic facial neuralgia, affections of the ear, affections of the eye, tumors due to faulty eruption of the teeth, various ulcerations and cancers which often the dentist first notices; indeed, a perfect dentist must know all this. But, without going through a medical course, he can acquire this knowledge by a special education—which is exactly what is being given in the dental schools—which is far from comprising the useless encyclopedia of medical knowledge. He who wants to know everything, knows nothing. It is possible that some exceptional few have the time and facility to afford the luxury of adding the medical to their dental diploma, but this can only be a more or less prominent exception. Even in the future those dentists will be few who can and will be able to put up over their offices the medical lightning-rod—that is to say, the diploma which protects against the lightning of the law all those who treat, anesthetize, and operate upon the sick. These are, in brief, the wise thoughts of Paul Bert.

Another of our teachers and colleagues, like Paul Bert himself, a physiologist and member of parliament—that is, the English parliament—Sir Michael Foster, received you in 1901 at Cambridge. He expressed the same sentiments as Paul Bert, but he demanded more—he desired a larger medical basis. In his familiar, humorous style he said: "The best mode of instruction for each profession and each career—this is the problem which occupies the University of Cambridge, and which occupies yourselves. Here we believe that instruction must be given in the shape of a cone—that is, it must have a wide base and a narrow top. That is the penetrating form of missile. People revolve in the turmoil of everyday life, bumping against things and against other people; but the cone-shaped bullet carries the farthest. The encyclopedic education is round. It

makes of a man a mental sphere which rolls without progressing, but of what use is that to you?"

Gentlemen, your preparation is cone-shaped, using these words of Foster—that is to say, you have given to these problems a provisory solution which is befitting to them, and the result has been admirable. In fifteen years you have educated generations of dentists who inspire the public with the same confidence as do licensed medical men and those of other reputable, licensed professions, and have reaped in return, for your own good and the welfare of the public—for it is the public that benefits from your progress—that which you have sown during your years of work, of wise, reasonable, and co-operative efforts.

The meeting then adjourned.

Executive Council.

First Session.

The session was opened at 2.30 P.M., March 25th, in the building of the Sociétés Savantes, President W. B. Paterson in the chair.

The following members were present: Messrs. Aguilar, Madrid. Campion, Manchester. Christensen, Copenhagen. Chiavaro, Rome. Godon, Paris. Grevers, Amsterdam. Guerini, Naples. Guy, Edinburgh. Guye, Geneva. Harrison, Brighton. Francis Jean, Paris. Jessen, Strassburg. Kirk, Philadelphia. Mummery, London. Rosenthal, Brussels. Roy, Paris. Siffre, Paris. Valenzuela, Seville. G. Villain, Paris. There were present also a number of the members of the commissions.

The President read letters of excuse from the following: Messrs. Avanzi, Verona. Du Bouchet, Paris. Förberg, Stockholm. Hielscher, Cologne. Hopewell-Smith, London. Römer, Strassburg. Smith-Housken, Christiania. Schaeffer-Stuckert, Frankfort a. M. Walkhoff, Munich. Weiser, Vienna. Whittaker, Manchester.

Mr. Guy, assistant secretary, acting as general secretary, read the report of Dr. Schaeffer-Stuckert, general secretary, which was voted upon and passed.

Dr. Rosenthal, treasurer, read his report, and asked for the nomination of assistant treasurers, and moved to have the unpaid dues prior to 1909 canceled.

Dr. Aguilar remarked that it had been formerly decided that one member of the Executive Council from each country should pledge himself to collect the dues for his country. The simplest way would be to collect the dues directly by drafts upon the individual members through local banks. For that reason he would not indorse the plan of Dr. Rosenthal as to the appointment of assistant treasurers, but he approved of his second motion.

Dr. Roy said that the dues of the members of the Executive Council were more strictly collectable, for these men were informed of their nomination, and by accepting their office undertook to fulfil their obligations. As to the adjunct members and the members of the commissions, their liability for dues was perhaps not so logical, by reason of the sometimes temporary character of their nomination, for only one session—the more so since Mr. Paterson in his opening address had recommended to increase the number of the commissions. Therefore, while one could be strict with the former, it was difficult to be so in regard to the latter.

Dr. Godon approved the proposition to cancel the dues outstanding prior to 1909. As to the collection of outstanding dues later than that, it was unnecessary to nominate national treasurers, because there were already such, and if not, the president of each national body took charge of their collection. As to regular members who were interested enough to attend the meetings, their dues could be collected at the meetings, but in the case of other members the dues could only be voluntary. The more members the merrier.

The report of Dr. Rosenthal was then voted upon and adopted.

The President proposed to nominate Messrs. Campion, Van der Hoeven, and

Roy as the Auditing Committee. (Motion accepted.)

Mr. Guy said that he acted only as a substitute for Dr. Schaeffer-Stuckert in the office of general secretary. He had prepared a report of the Berlin meeting in English, of which he would give copies to the members.

Dr. G. Villain said that as secretary of the Berlin meeting he had prepared a report in French, the copies of which were expected any minute. He noted slight differences in the two reports.

Mr. Guy presented a list of candidates for admission to the F. D. I. Dr. G. Villain gave the names of Huet of Brussels, G. Robin of Paris, and Freeman of Besançon as candidates. Dr. Godon applied for the admission of Dr. Siffre, of Paris. All these applications were accepted.

The President handed Dr. Rosenthal a check for the dues of the English delegates, and Dr. Godon one for the French delegates in the Executive Council.

The President remarked that the nomination of the Commission of Hygiene was in order.

Dr. Lenhardtson, member of the commission, asked that the commission should also include army and navy dental services.

The President replied that that had already been agreed upon.

Dr. Jessen asked that two vice-presidents be added to the commission—Drs. Potter of Boston and Christensen of Copenhagen.

The President proposed a third—Dr. Wms. Donnally of Washington. (Dr. Jessen seconded the motion.) These three nominations were voted upon and passed.

Dr. Godon proposed Dr. Siffre as French vice-president. (Motion carried.)

Dr. Jessen proposed Drs. Donnally and Siffre as vice-presidents of a subcommission—that on army and navy dental services. (Motion carried.)

He also proposed Dr. Steffen of Cuxhaven as secretary of that sub-commission. (Motion carried.)

Mr. Guy proposed that the Commission on Hygiene should not be combined with that on dental hygiene in the army and navy, but should be a distinct body. M. Guye seconded the motion.

Dr. Godon preferred to leave the management of these two commissions for at least a few years to Dr. Jessen, who was very active. He demanded a vote on this point.

Mr. Cunningham, member of the Commission on Hygiene, asked that Dr. Jessen should have the right to nominate vice-presidents.

The President repeated the motion of Dr. Guy.

Dr. Lenhardtson remarked that the two questions were too closely connected to be separated.

Mr. Guy's motion was then put to a vote and was lost.

Dr. Roy seconded Dr. Godon's motion, which was voted upon and passed.

Dr. Aguilar proposed to send a telegram of thanks to the King of Sweden, who had accepted the patronage of the Commission on Hygiene, and Dr. Lenhardtson said that such a telegram would be well received. (Motion adopted.)

The President asked whether the Commission on Education should be nominated at the present session. The assembly decided in the affirmative.

Dr. Aguilar proposed to appoint a subcommittee of three members to present on the following day a list of names for the commission.

Dr. G. Villain seconded the motion as to the nomination of a subcommittee, but asked that it should examine the constitution of the bureau of commissions, and that one should not immediately proceed to nominate presidents. (Motion adopted.)

Messrs. Aguilar, Roy, and G. Villain were appointed.

Dr. Aguilar made a motion concerning the nomination of a commission to formulate a code of ethics.

Dr. Godon remarked that such a commission was already in existence, namely, the Commission on Legislation.

Dr. Aguilar demanded a subcommittee on Ethics.

Messrs. Cunningham and Freeman opposed the motion, believing that the committee was needless and would be in an awkward situation if its advice were not followed.

Dr. Aguilar said that it was not a question of laying down laws of behavior for dentists, but simply one of making recommendations.

The President remarked that the F. D. I. was only a consulting body.

Mr. Guy said that it was simply a question of establishing the general principles on which practitioners could base their conduct, simply recommending their observation.

The motion was referred to the Commission on Jurisprudence.

The President asked whether the assembly wished to nominate the Commission on Terminology. (Decided in the affirmative.)

Mr. Harrison proposed Dr. Grevers as president. (Motion adopted.)

Dr. Godon asked that all commissions be re-elected in their present condition.

The President proposed that the three commissioners just elected should make a report on this matter the next day. (Motion carried.)

The President asked the assembly if they wished to nominate other commissions. (Decided in the negative.)

NOMINATIONS FOR THE MILLER AWARD.

The President addressed the members of the Executive Council as forming the jury for the awarding of the Miller prize. He then read letters from Messrs. Förberg, Schaeffer-Stuckert, and Weiser, proposing Dr. Röse for the Miller prize, and stated that no other name had yet been proposed to him.

Dr. Aguilar asked permission to read the rules according to which the Miller prize was to be awarded. (Motion adopted and Dr. Aguilar read the rules.)

The President thanked Dr. Aguilar for having had these rules printed in the four official languages of the F. D. I.

Mr. Mummery also proposed Dr. Röse, who had devoted twenty-five years of his life to dental hygiene.

Dr. Fr. Jean stated that the French F. D. N. proposed first of all Dr. Godon, and second, in alphabetical order: Black, Brophy, Choquet, Delair, Galippe, Jessen, Claude Martin, Mummery, Röse, Roy, Siffre, Taggart, and Walkhoff.

Dr. Godon said that he had told the F. D. N. that he could not accept the Miller prize. He was of the opinion that this prize should not be awarded to one single person, but to the F. D. I. itself, possibly in the form of medals given to all those of its members who had worked for ten years and more for the progress of the profession. He added that by waiting for two years for the award of the prize to one individual, the amount of accrued interest to be offered would be greater.

The President thought that it would be better not to award it at all than to award it to a number of men. The Congress of Berlin had decided that it must be awarded.

Mr. Campion also proposed Dr. Röse.

The President said that Dr. Röse was already on the list of the F. D. N.

Dr. Aguilar pointed out the claims of different candidates: Dr. Black had consecrated his whole life to dental science; Dr. Röse also was very deserving; Dr. Guerini had done great research work for his "History of Dentistry"; Dr. Godon was one of the founders of the F. D. I. and had done very much for the dental profession; Dr. Claude Martin was an eminent prosthetic dentist.

Dr. Guerini said: Since Dr. Godon in his modesty has wished to have his name canceled from the list of candidates for the Miller prize, I wish to say a few words concerning the candidate Professor Black. Undoubtedly this famous man, owing to the merit that the whole world recognizes in him, and concerning which Dr. Aguilar has already spoken, deserves the Miller prize a thousand times over. He is the father of our

profession, and by reason of his very advanced age it behooves us to award to him the prize this year, for next year it might be too late, and regrets could in no wise compensate for our inexcusable postponement.

The President asked if there were other names to propose, and whether the assembly wished to vote for one person, for two, or for more.

Dr. Francis Jean stated that, considering the refusal of Dr. Godon, the French F. D. N. proposed Dr. Black.

Mr. Campion asked to have the awarding postponed until the next day, in order that the members of the jury might have time for reflection.

The President opposed this motion, saying that they had had all the time necessary for reflecting ever since the Congress of Berlin, *i.e.* since August 1909. He asked again whether the assembly wished to vote for one, for two, or for more persons.

Dr. Roy recommended that the prize be awarded to a single person.

The motion to award the prize to a single person was put to the vote and was adopted.

Dr. Siffre asked whether Dr. Godon was a candidate, seeing that his motion as to the mode of the award had been voted down.

Dr. Godon said that he considered it his duty not to accept; he regarded himself as sufficiently honored by his selection by the French F. D. N.

Dr. G. Villain asked that only the qualification of the candidates be considered at the present session, and that the vote be postponed until the next day, as the program only mentioned the consideration of the qualifications of the candidates, and referred to the awarding of the prize itself on the following day.

Dr. Roy regretted that all countries had not done like the French F. D. N., and presented a list of candidates. It was wise to first think and then vote. He also asked that the prize be awarded at one session, but that the prize be handed over to the winner at the opening of the next session. He seconded the motion of Mr. Campion, which was also seconded by Dr. G. Villain.

Dr. Guy opposed this motion. The awarding of the prize, he said, was scheduled by the program for this session, and the next day some members might be absent.

The motion of Mr. Campion was put to a vote and rejected, and the matter was ready for a secret ballot. Messrs. Guy and Rosenthal were nominated as tellers, and collected the votes.

Dr. Black received twelve and Dr. Röse seven votes.

Dr. Black was declared chosen, with the unanimous applause of the members of the Executive Council.

Dr. Aguilar asked that Dr. Kirk be commissioned to telegraph the news to Dr. Black at the expense of the F. D. I. (Motion adopted.)

Dr. Kirk expressed thanks for the great honor bestowed upon his country.

Mr. Campion then asked, in the name of the national committee of Great Britain, that a committee be nominated to make a report to the Executive Council of 1911 concerning the procedure to be followed in the distribution of the Miller prize in the future.

Mr. Guy read a proposition of the Miller Dental Club of Berlin concerning the admission of members to the international congresses.

Dr. Aguilar seconded that motion, and asked that this proposition be referred to the organization committee of the next International Dental Congress to be held in London in 1914, with the approval of the F. D. I. (Motion adopted.)

Dr. Jessen made a communication concerning the activity of the Commission on Hygiene since the Congress of Berlin.

Dr. Godon called the attention of the F. D. I. to the work accomplished by Dr. Jessen since his nomination to the presidency of that commission, of which work his report was a *résumé*. Dr. Jessen proposed to establish in every country a national committee on hygiene.

The work of such committees would bring true glory to the Federation.

The meeting adjourned at 5.30 P.M.

Second Session.

The session opened at 2.30 P.M., on March 26th, in the building of the Sociétés Savantes, President W. B. Paterson in the chair.

The following members were present: Messrs. Aguilar, Christensen, Chiavaro, Godon, Grevers, Guerini, Guy, Guye, Harrison, F. Jean, Jessen, Kirk, Mummery, Rosenthal, Roy, Siffre, Valenzuela, G. Villain; also several of the members of the commissions.

The President read a telegram of greeting from Dr. Walkhoff of Munich.

Dr. Quarterman of Brussels applied for admission, as a regular member of the Dental Dispensary of Brussels. (Admission granted.)

Mr. Mummery presented a report concerning the motion of Mr. Campion made the day before, concerning the nomination of a committee to report to the Executive Council of 1911 on a mode of procedure to be followed in the future in the distribution of the Miller prize. His opinion was a favorable one, and the motion was adopted.

Dr. Roy asked that the Miller prize be formally presented at the opening session of the meeting following this one, in which it should have been presented.

Mr. Guy proposed that the diploma and the prize be sent by registered mail.

Dr. Aguilar opposed this proposition, and moved to intrust a member of the Executive Council from the prize-winner's country, or the diplomatic agent for that country, with the delivery of the prize. The Nobel prize was delivered in that way.

Dr. Lenhardtson remarked that the winner of the Nobel prize was obliged to come to Stockholm.

Dr. Godon said that the winner should not be made to wait a year or two to get his prize, nor should he be made to call for it. He proposed that the national federation of the winner's country should be intrusted with the delivery of the prize.

The President was of the opinion that no rule should be established in this respect.

Mr. Guy said Dr. Black would be glad to come himself.

Mr. Harrison proposed to leave to Dr. Black the choice of what he wished to do.

The President announced that Dr. Röse had handed in his resignation as administrator of the Miller fund, and that the committee of administrators had nominated Dr. Weiser of Vienna in his place.

Dr. Aguilar reported that the fund had been deposited at the Deutsche Bank, Berlin, and also reported on the financial situation of the Miller prize, and asked that the sums subscribed but not yet collected be sent as soon as possible. He reminded the members that the signatures of five administrators had been registered, and that the signatures of two of them were necessary for any withdrawal. He added that the American committee had not yet forwarded their contribution.

The President announced that Dr. Röse had handed over the funds to Dr. Weiser, and that Dr. Chiavaro also had funds to hand in. He proposed to announce in the dental journals that Dr. Aguilar is secretary-treasurer of the Miller foundation, and that he is authorized to receive the subscriptions.

Dr. Aguilar's report was put to a vote and adopted.

Dr. Godon asked that the decision concerning the medal, the size of the medal, and the diploma, be left to the committee of five administrators.

Dr. Jessen reported on the resolutions passed by the Commission on Hygiene during the morning session.

These resolutions were put to a vote and accepted.

The President proposed Messrs. Jessen, Lenhardtson, Christensen, and Siffre as representatives of the F. D. I. at the Congress for School Hygiene, to be held

in Paris in August 1910. (Motion adopted.)

Dr. Aguilar asked to have the name of Dr. Amoëdo added as official delegate of the Spanish Government. (Motion adopted.)

Mr. Guy announced that the Commission on Education in its morning session had nominated Dr. Brophy as honorary president, Dr. Kirk as president, Messrs. Aguilar, Cryer, Guy, Francis Jean, Walkhoff, and Weiser as vice-presidents, Dr. Roy as secretary, and Messrs. Campion and G. Villain as assistant secretaries. It was also decided that the President make an inaugural address next year which was to form a basis for the discussion of the program of the different branches of instruction. Messrs. Aguilar, Grevers, Guy, Roy, and Walkhoff had been commissioned to make a report for their respective countries for the next year. Dr. Godon had been asked to make a report at the next meeting concerning the unification of the requirements for practice as authorized by the degree of Doctor of Dental Surgery.

Dr. Kirk had a report read concerning the Dental Faculties Association of American Universities.

The various resolutions of the Commission on Education were put to a vote and ratified.

Dr. Godon proposed renominating the entire Commission on Hygiene.

Dr. Roy asked that all the present commissions be retained.

Dr. Aguilar advised renominating all the commissions and adding a few names.

The President said that in this case reference must be taken to the list published in the minutes of the Brussels meeting.

It was decided to renominate all the commissions as mentioned in those minutes, with the addition of the five names voted upon the day before to the Commission on Hygiene, namely, Messrs. Potter, Christensen, Donnally, Siffre, and Steffen, and to the Commission on Education to add G. Robin, as proposed by that commission. (Motion adopted.)

Dr. Rosenthal presented the report of the auditors, which was approved and adopted.

He also read a report concerning the Commission on Terminology, which was approved.

The President proposed that the next session be held in London in August 1911. (Motion adopted.)

At the request of Messrs. Rosenthal and Huet, Joachim Albert of Brussels was admitted as a member of the F. D. I.

Messrs. Huet, Quintin, and Rosenthal were nominated as delegates to the Congress on Bibliography at Brussels in 1910.

Dr. Aguilar announced that an International Medical Federation was being constituted at The Hague after the model of the F. D. I.

The meeting was adjourned at 4 P.M.

Commission on Hygiene.

The meeting opened at 11 A.M., March 26th, at the building of the Sociétés Savantes, with Dr. Jessen, president of the commission, in the chair. Present were —Messrs. Anthony, Brooks, Christensen, Cunningham, Davy, Freeman, Godon, Grevers, Guerini, Guy, Francis Jean, Jenkins, Johnston, Kirk, Lenhardtson, Morris Stewart, Peacock, Roy, Siffre, Van der Hoeven, G. Villain, Wallis, and Williams.

The President bade the members welcome, thanking them for their presence, and then read a report explaining the rules of the commission, its purpose, and the work to be accomplished, as outlined in the following six propositions:

First: The Commission on Hygiene will be entirely independent, and will present each year a report of its work to the F. D. I.

Second: One representative of the School Dentists' Society will be delegated to the English national committee.

Third: In each country the national committee on hygiene will affiliate itself with the anti-tuberculosis league.

Fourth: The manufacturers of charts and tooth-brushes will be asked to donate ten per cent. of their profits to the funds of the commission.

Fifth: The commission will ask for a subvention from the Rockefeller foundation.

Sixth: Official delegates will be nominated for the School Hygiene Congress to be held in Paris in August 1910.

ADDRESS OF DR. JESSEN.

Dr. Jessen then delivered the following address on "The International Commission on Public Hygiene and Its Aims."

Our era stands under the sign of social philanthrophy. After the guiding lines for the weal of the economically weak had been marked by state legislation, a lively activity toward the development of social guardianship has set in in all domains. To this activity are due, besides many other charitable institutions, the vacation colonies, the open-air colonies, the homes for soldiers, for nursing babies, for mothers, the sanatoriums for the tuberculous, etc. To this movement is also due the combating of dental caries, the tremendous dissemination of which has assumed the character of a national disease, so that today almost all public organs are pointing out the dangers involved.

The organization of municipal dental clinics has proved to be the most effective means for the combating of dental caries. This is one of the main purposes of the "German Central Committee for the Care of the Teeth in Schools," with its president, his Excellency the Minister of State, von Moeller of Berlin.

Before the German Central Committee had been founded, on February 1, 1909, the Fédération Dentaire Internationale, formed as a federation of dentists of all civilized countries at the time of the International Exhibition of Paris in 1900, had put on its program the systematic combat against dental disease among the people. From the day of its foundation, the F. D. I. has assumed the task of preparing international dental congresses to be held at intervals of five years. This was first done for the Fourth International Congress, which was held in 1904, during the World's Fair at St. Louis. On behalf of the German dentists the late and much-lamented Professor Miller, whose world-wide renown as a dental investigator stands unchallenged, extended at St. Louis an invitation, which was accepted, to hold the Fifth International Congress at Berlin, where at the same time the fiftieth anniversary of the Centralverein of German Dentists would be celebrated.

In the preparations for this congress, which involved stupendous work, the F. D. I. proved itself invaluable. Secretary-general Dr. Schaeffer-Stuckert of Frankfurt a. Main, together with the board of commissioners and the local committee of Berlin had to overcome a task the results of which met with general recognition. The result of the congress was demonstrated to the public by an exhibition such as had never before been offered in such variety, and will hardly ever be excelled in completeness. The sessions of the congress were presided over by Privy Councillor Prof. Dr. Walkhoff of Munich.

The congress was composed of twelve sections, the tenth section being devoted to Hygiene. From Sweden a motion had been made before the congress to form an "International Commission of Public Oral Hygiene," to include medical men, dentists, pedagogs, and administrative officers from all civilized countries. The realization of such an all-comprising committee, to be composed of so widely different professions, proved to be impossible. Instead, after lengthy discussions, the International Commission of Public Oral Hygiene was constituted in its present form, the Commission of Hygiene of the F. D. I., that had existed since 1900, being amalgamated with the newly constituted international commission. This commission is limited to dentists, and comprises twenty national committees. The following countries are represented: Belgium, Cuba, Denmark, Germany, England, Finland, France, Holland, Italy, Luxembourg, Mexico, Norway,

Austria, Portugal, Russia, Sweden, Switzerland, Spain, Hungary, and the United States of America.

According to the resolutions formulated at the congress, the national committees have the duty to co-operate in their respective countries with the government, with the already existing associations for school hygiene, and with influential personages, in order to materialize the aims of the commission. The board of directors have the duty to maintain the committees in the different countries and to direct their action toward a uniform method of procedure. For this purpose from time to time open letters are sent out in which the more urgent duties are pointed out, and a general report is given of the progress made by the individual national committees. In these propositions special stress is laid on the realization of practical care of the teeth, which is to be preceded by a systematic instruction in the schools, these being the sources of all public culture. This work of enlightenment is facilitated by suitable means of demonstration, the selection of which is left to the board of directors.

Apart from Germany, where the dentists had developed a successful activity in this respect for many years, the first favorable results were brought about in Sweden and Denmark. The Swedish national committee, composed of Prof. Carl Christensen and Viggo Wigh of Copenhagen, and M. Klaer of Svendborg, after having been constituted, immediately entered upon a lively activity and brought about the constitution of a "Danish Association for the Care of Children's Teeth," on January 17, 1910. This association called the chairman of the International Commission to Copenhagen, where before the Medical Society in the presence of invited guests, and on the following day before a great mass meeting, he explained the purpose and aim of the movement and its importance for the public health. To this Danish association belong the representatives of all influential circles, so that its success in that country is assured.

Denmark's example was immediately followed by Sweden, where by the activity of Albin Lenhardtson of Stockholm, in collaboration with Victor Bensow and Dr. Hjalmar Carlson of Goeteborg, the ground had been prepared. The Medical Association of Stockholm called a meeting under the presidency of Governor-general R. Dickson, which was attended by representatives of the municipal authorities and by specialists not only from Stockholm, but from all Sweden, and even by the Finnish national committee. Addresses were delivered by eminent specialists, each from his own point of view emphasizing the extraordinary significance of a rational care of the teeth and mouth for the general health of the body. By unanimous vote the "Swedish National Association for Oral Hygiene" was constituted, under the presidency of Governor-general Dickson.

On the previous day an audience had been granted by his Majesty King Gustaf to the board of directors of the International Commission and the members of the Swedish national committee, the king gracefully accepting as patron the protectorship of the International Commission on Public Hygiene, and showing great interest in the important work of this international association.

It is to be expected that the International Commission will persevere in continuing the work begun under its high protector with such favorable auspices, and that very soon similar associations to those founded in the Scandinavian countries will be constituted in the other nations affiliated with the Federation. In Holland, owing to the initiative of the national committee, Klinkhammer, Stark, and Witthaus, and in Finland under that of Aspelund, Kuskell, and Weber, national associations for public oral hygiene have also been founded.

The care of the teeth in the schools is the foundation upon which rests the health of the people; it is to be continued in the army, the charities and hospitals, and in the entire population; it is of international importance, and must force the eyes of the whole world to be directed toward our profession—and it is

destined to conquer, for our calling its rightful place.

Mr. Cunningham thanked Dr. Jessen for his report and for the work that he had accomplished, especially as the commission had not previously done anything for several years; the commission had been preparing the lines on which it was to operate. He proposed a vote of thanks to Dr. Jessen for the task accomplished. (Motion adopted.)

Dr. Godon objected that it was incorrect to say that the commission had previously done nothing. He adduced the report of Dr. Frank of Vienna, made at Stockholm in 1902, and the work accomplished by the commission under the presidency of Dr. Bryan of Basel since that time. It was, however, indisputable that Dr. Jessen had developed a most commendable activity.

Dr. Jessen thanked the previous speakers, and proposed that the commission should have one representative in the national committee of each country. (Motion adopted.)

Regarding the first of the six propositions in the report, stating that the Commission on Hygiene should be "entirely independent," and should only present each year a report concerning its work to the F. D. I.:

Dr. Godon said that this absolute independence was not acceptable.

Mr. Cunningham said that Dr. Jessen would consent to the canceling of the words "entirely independent."

Dr. Von der Hoeven seconded the presentation of an annual report.

Dr. Godon added that all resolutions must be submitted to the Executive Council of the F. D. I.

Concerning the second proposition, that one member of the School Dentists' Society should be delegated to the English national committee:

The President said that this was only a question of recommendation. (The recommendation was accepted.)

The President recommended to the F. D. I. to take part in the School Hygiene Congress.

The six resolutions were then put to a vote and approved of without further modifications.

A report of Dr. Förberg was read on the work accomplished in Sweden in matters of hygiene.

Mr. Cunningham proposed a vote of thanks to Messrs. Jessen, Lenhardtson, and Christensen, who had done great work. (Motion adopted.)

The President thanked the meeting for the interest taken in the commission, and promised to do all in his power to aid the accomplishment of its work.

The meeting was adjourned at 12.30 P.M.

Commission on Education.

The meeting was opened at 11.30 A.M., March 26th.

Dr. Roy, on behalf of the Committee on the Constitution of the Commissions, demonstrated the necessity of reconstituting the commission, and, regretting the absence of Dr. Brophy, who for ten years uninterruptedly had so ably directed its work, proposed the nomination of Dr. Brophy as honorary president. (Motion adopted.)

He then proposed the election of Dr. Kirk to the presidency. (This motion was accepted by acclamation.)

Dr. Kirk took the chair and put to a vote the proposition of the committee nominating Dr. Roy as secretary. (This nomination was unanimously accepted.)

The President then made a short address. After thanking the members for having chosen him to preside over their work, he said he was happy to assume that post in Paris, the city of intellectual education, near that place where one could appreciate the grandeur of the French character, for on the statue of that revolutionist, Danton, one could read the words, "After bread, the first need of the people is education." He then remarked that the two commissions that occupied in the Federation a prominent place owing to the work which

they must continually accomplish, were the Commission on Hygiene and the Commission on Education, of which the latter was the more important, and declared that he would devote all his efforts to its work. He then eulogized Dr. Brophy, and promised that he would do all in his power to follow the example of his predecessor in the presidency.

Dr. G. Villain asked that the commission be immediately constituted by nominating national representatives.

Dr. Guy proposed to ask each national committee for a proportionate list of members, before recommending it to the commission. He was of the opinion that the working program should be immediately printed. He reminded the members of the work accomplished by the preceding commission, *i.e.* the adoption of the maximum and the minimum curriculum. He thought it not necessary to revise this program, but simply to take up these subjects or portions thereof for discussion.

Dr. Kirk expressed the opinion that nothing better could be done than simply to continue the work as already undertaken. The program was established, and its execution should be carried out.

Dr. Godon proposed that examination be made of the details concerning the adopted plans, the work to be accomplished, the requirements of instruction, the number of years to be devoted to each subject. He also proposed to discuss the unification of the degree.

Mr. Guy proposed that the technical prosthetic instruction should be discussed.

Dr. Roy seconded these motions, and proposed the following order:

Method of instruction.

Number and nature of practical work.

Organization of the technical program, with the order of operations to be accomplished.

He thought that one could begin with prosthetics or with operative dentistry, and that it would be well to consult with the dental teachers and ask them for a report concerning their methods of instruction.

Mr. Paterson also thought that the moment had arrived for discussing the methods of instruction. He remarked that numerous difficulties would be encountered in the execution of the program of the F. D. I., as each school maintained its own method. He thought that the questions would have to be treated from a very elevated point of view.

Dr. Kirk said that details should not be included, and the particular procedures should be left aside, and only the pedagogical methods should be considered.

Dr. Godon remarked that the F. D. I. was not a jury, that it did not make decisions, that it was an international consulting body which examined and recommended a method without demanding its adoption. He proposed to present at the next session a pedagogical method for each branch.

Dr. Rosenthal said that preliminary education had been discussed in the preceding sessions; that it remained to discuss the professional education, and it seemed logical to first take up the standard methods.

Mr. Paterson proposed that one, two, or three members of a country, according to its importance, be asked to make a report on the pedagogical methods in use in their country, such reports to be presented at the next meeting.

Dr. Guy said that the work of five years done by the Commission on Education must be carried out, and he asked that the president next year make an address on the pedagogical methods of dentistry. The president could ask two or three members to speak on some special branch of this subject; he could assign the reports and select the men to report.

Dr. Kirk asked that the proposition of Mr. Guy be supplemented by that of Dr. Roy concerning the inquiry from dental

teachers. (These two motions were together accepted.)

Mr. Paterson proposed that the men to report should be nominated immediately. (Motion adopted. Messrs, Aguilar, Grevers, Guy, Kirk, Roy, and Walkhoff were nominated.)

Mr. Paterson made a motion that each man to report should send his report to the president, Dr. Kirk, who could furnish a consolidated report at the next meeting of the commission.

It was decided that the partial reports should be submitted to the president before March 31, 1911.

Dr. G. Villain asked that the number of members of the commission be completed. Messrs. Aguilar, Cryer, Guy, Francis Jean, Walkhoff, and Weiser were elected vice-presidents, Messrs. Campion and G. Villain assistant secretaries.

Dr. G. Villain proposed that the list of members of the commission be maintained in the present status until the national committees had handed in their lists if they desired to modify their representation. In addition he asked to have Dr. G. Robin of Paris elected. (Motion adopted.)

Dr. G. Villain repeated the proposition of Dr. Godon concerning the unification of the degree, seconded it, and asked that a vote should be formulated.

Mr. Paterson expressed the opinion that the hour had not yet arrived for unifying the degree. He said that in England especially this would be more embarrassing than useful.

Dr. Godon remarked that in many countries, on the contrary, a vote of the F. D. I. would help toward attaining the desired aim. He remarked that a resolution had been passed by the Section on Education of the Berlin Congress. A formula should be found which could aid one party without impeding the other.

Dr. Roy seconded the motion.

Mr. Paterson said that he did not consider the question as having been sufficiently discussed. He had not known of the action taken at Berlin, and desired some discussion before the vote was passed. He proposed to take up current business.

Dr. Rosenthal said that it would be preferable to first unify the mode of instruction before unifying the degree; and after these two unifications had been accomplished it would only be one more step to the discussion of international license for practice. He opposed Mr. Paterson's motion, and asked that a member be nominated to report, so that this question should be put on the program for the next session.

Dr. Godon seconded the motion.

Dr. Roy proposed Dr. Godon for the making of the report.

Mr. Paterson withdrew his motion, and the motions of Messrs. Rosenthal and Roy were adopted.

Dr. Kirk read a report of the organization of the Dental Faculties Association of American Universities. A copy of the organization of that association and its laws and by-laws was placed on the table.

Adjourned.

G. Villain, *Assistant Secretary.*

MEETING OF THE AMERICAN DENTAL SOCIETY OF EUROPE.

Held in Paris, March 25-28, 1910.

Report by Dr. W. HIRSCHFELD.

THE great success of this reunion is attributable to several causes. Besides incidental reasons, such as a sojourn in the most beautiful city of the world and the extraordinary efforts of the local committee, eager to offer various entertainments, the administration of the American Society is so well organized that all its efforts converge to one single aim—namely, to do something for the advancement of the profession by laying absolutely aside all personal tendencies. Assembling once a year, the members are confident in anticipation of much profit to be derived from the new ideas offered, and from renewed enthusiasm toward perfection. For this reason the great American Society has acquired a reputation which places it in a really privileged, if not enviable position.

The congress of this year was opened at the Continental Hotel, by the president, Dr. Quintéro of Lyons. Seventy members were assembled, together with some thirty visitors from the different countries of Europe. The program, in spite of some much-regretted defects, realized all that was promised and more. It was divided into three distinct portions: First, the papers on current practice; second, papers on subjects of a more scientific character; third, practical demonstrations and clinics.

First, Dr. Kelsey of Marseilles made a plea in favor of honest dentistry. It is needless to say that this communication was honored by a very extensive discussion.

Dr. Portuondo of Madrid spoke of the treatment of dead teeth. This subject, though it is presented at almost every meeting, is still a favorite for discussion. In cases of blind abscess the essayist advises opening the alveolus whenever an internal suppuration manifests itself at the apical foramen.

Dr. Hirschfeld of Paris opposed that idea. He believes that nature, by establishing congestion, indicates plainly the cases in which opening of the alveolus is absolutely necessary. In his opinion congestion not only shows the necessity of opening up the bone, but also indicates the exact spot where this surgical intervention is to be made. In cases where a simple suppuration exists, he proposes intervention merely by way of the foramen by the tricresol-formalin method of Buckley.

Dr. Kritchewsky of Paris read a very interesting essay on his treatment of pyorrhea with the ammonium fluorid of Dr. Head of Philadelphia. He has obtained this drug in the form of powder, which, if introduced deeply into the pockets with platinum sounds, produces a rather rapid improvement, if not final cure. The essay was followed by a presentation of several patients treated by this method with indisputable success.

Professor Sachs of Berlin presented his method of anchoring bridges in inlays. The bridges anchored at both ends in simple inlays offer no stability. It is necessary that one of the inlays be fixed in the root by a pivot. As a typical case he selected the replacing of the two upper bicuspids, both abutment teeth being entirely sound. After devitalizing the canine and sealing its foramen, he enlarges the root for an iridio-platinum pivot fixed in an inlay that is set in the

lingual portion of the canine. In the molar he sets another inlay in the mesio-occlusal surface. A spur is adjusted to this inlay which terminates the bridge at that point. This spur is soldered to the bridge so as to rest simply in a joint made in the inlay. The bridge is then cemented in the cavity of the canine and rests on the molar. In this manner great stability and solidity are obtained.

This method was not approved of by all, especially by Dr. Wm. Davenport of Paris, who doubted the solidity of that sort of work.

Dr. Hirschfeld objected to the technical difficulties involved in these bridges, which would limit their use to a small number of dentists.

Dr. Solbrig of Paris suggested constructing the bridge in the opposite way, that is by making a strong anchorage in the devitalized molar, and giving the bridge support by an inlay set in the canine.

Dr. Jenkins gave an interesting description of a bridge with an all-porcelain base. This eminent specialist in porcelain work is firmly convinced that nothing equals porcelain in the mouth. Porcelain is generally accused of lack of resistance. He remarked that "This is a mistake, because, with a solid iridio-platinum base, all danger of breaking is precluded." He moreover refuted the idea that this kind of work offers greater difficulties in construction than gold bridges. After a little practice the porcelain bridges are easier to make than the others.

Several *confrères,* especially Dr. Wm. Davenport, took part in the discussion.

A great many lantern-slide lectures were also given.

Dr. Anéma of Paris proved his contention that the correct lines of the human face are principally due to a regular set of teeth, by photographs of patients with scientifically regulated teeth. He closed his paper, which was received with a great deal of applause, with a series of lantern slides representing classic faces such as that of the Venus of Milo and others, in order to show the ideal lines.

Dr. Solbrig gave a most interesting new idea of the conservation or rather the preservation of the fissures of the teeth. This method consists in filling the fissures in the first and second molars at the time of their eruption with copper oxyphosphate. The essayist illustrated his method by very clear photographs, Messrs. L. Mitchell, Webster, C. Boedecker, and Spring taking part in the discussion.

Dr. Younger of Paris presented a series of slides illustrating his method of regulating teeth with silk ligatures.

Dr. Kirk, the famous editor of the Dental Cosmos, was enthusiastically applauded for his essay on "Standardization in Dental Practice." Dr. Cunningham replied to the essayist with his usual fervor and humor.

Dr. Boedecker of Berlin read a very interesting paper on "Stains in Microscopic Slides," illustrating his researches by lantern slides.

Dr. Abbott of Berlin read a paper on cures produced by X rays, illustrating his remarks with exceptionally clear and beautiful slides.

The great success of the meeting was manifested especially by the practical demonstrations and clinics. By a wonderful arrangement the "Mirror hall" of the Continental Hotel had been transformed into a regular dental school, the rows of chairs and operating tables reminding one of the hall in the Dental School of Paris. All clinicians had the finest opportunity to carry on their operations. Of demonstrations upon patients the following are to be mentioned:

Dr. Spaulding of Paris filled a distal cavity in an upper bicuspid by reconstructing the contours with a mixture of gold and tin foil. This mixture, which is rather hard to manipulate, affords absolute solidity, and preserves especially the gingival borders against recurrent caries.

Dr. Younger gave a practical demonstration of the superior qualities of silk

ligatures for the rapid regulation of teeth.

PALATAL MALFORMATION.

Our great Delair easily carried off the honors of the day by presenting several patients in whom palatal malformation has been regulated by his ingenious apparatus for direct prosthesis in symphysis of the pharynx.

The following demonstrations were given:

Three patients were presented who had been operated upon by Drs. E. Koenig, Lermoyez, Grossard, and G. Laurens. In the first patient, a small girl of eight years of age who had been operated upon a year before, the artificially obtained pharynx appeared normal, the child breathing through the nose, speaking without nasal tones, and sleeping with closed mouth. In the second patient, a young girl who had been operated upon seventeen days before, the apparatus, which was easily tolerated, was coming into place and the pharynx was being enlarged day by day. The rubbers in the mechanism are renewed every five days, assuring the progressive widening of the pillars, while the articulating apparatus reproduces the three simultaneous movements of the velum and the pillars. This apparatus has been described in the DENTAL COSMOS, the *New York Medical Herald, l'Odontologie,* and *Archives of Laryngology.* The third patient, in order to become accustomed to it, was wearing a retention plate to which, at the time of the operation—which will be made immediately—the movable articulating carriage will be attached which is to support the plinths of the pillars. This apparatus must be worn until epidermization is achieved—that is, for about ten weeks. Symphysis of the pharynx in syphilitics, although rare, has been observed by Dr. Delair a dozen times, and an equal number of cases have been reported to him.

Five apparatus of this sort have been applied by the essayist during one year: A velum with valve, first for congenital, simple, or complex clefts. Second, for velums that are too short in consequence of staphylorrhaphy. This same mechanism is articulated so as to unite the artificial velum of soft rubber with the palatal portion. The movements of elevating the velum during the articulation of words and during deglutition are assured by the alternate extension and relaxation of a rubber disk which is fastened on both pieces of the apparatus. In that way the valve at the desired moment is applied against the superior constrictor of the pharynx, and nasal occlusion is produced, assuring the correct emission of the articulated syllables. The valvular velum must have the same dimensions as the nasal cavity. For each case a special valve and velum must be selected according to the dimensions of the fissure.

Dr. Kirk remarked that he had followed these demonstrations with great interest, and had observed that not only did the patients speak very poorly without the apparatus, but also the muscles of the face, by supplementing the functions of certain velar muscles for the articulation of sounds, produced a series of grimaces, due to the action of the compressores nari, which are very disfiguring. With Delair's apparatus these symptoms disappear, and speech becomes normal. Velums can be put in at any age. Dr. Delair has applied them in children of five years as well as in patients of forty years of age.

Among the practical demonstrations must be mentioned Dr. Solbrig's. He gave some demonstrations of a new material for making models. This material possesses the hardness of stone, and permits the casting of gold directly upon it, the flame not altering its consistence, which is very important in directly soldering gold portions in bridge work, etc. According to Professor Sachs' opinion, this material may be of great usefulness in modern prosthetics.

M. Réal made some experiments with his vacuum machine which attracted especial attention. It must be conceded that the principle of casting based on the removal of the main obstacle, namely air, is at present, perhaps, the only rational

one. To this fact is probably due the never-failing success with which M. Réal can cast all his plates with porcelain teeth without fear of checking them by the influence of the molten gold.

On the next table a new electric furnace (Mitchell) was exhibited after the modification of Mr. Field of London. This inventor has constructed an interior muffle in fused silica which really represents a muffle of glass. This muffle was heated to about 1500 degrees centigrade. Mr. Field even poured some drops of water in it with no break occurring. It may be said that this new sort of muffle attains the ideal of an electric furnace, namely, the non-breakable furnace. For the same reason we should mention the dish, which is also constructed of silica, and is intended to pickle the metal pieces in the acid on the fire. Mr. Field put this dish over a very strong Bunsen flame without spoiling or breaking the glass.

Dr. Strong of Landau made some practical experiments with the coloring of porcelain teeth. For this purpose he used a whole palette of colors like a painter in order to faithfully reproduce all the pigments and shades of the human teeth, immediately baking them in an electric furnace. This method found general approval, as it may render very useful services to practitioners who emphasize the artistic side of our profession.

Dr. Henry Weber of Paris showed a very ingenious electric apparatus to automatically hand the operator various instruments such as the mouth reflector, the mirror, the hot-air syringe, and others. As the inventor was not present, this apparatus, which seemed constructed most ingeniously, could not be demonstrated as advantageously as it deserved to be. It is, however, beyond doubt that it has a great future. We hope that Dr. Weber will soon have an opportunity to demonstrate it personally.

Dr. Jenkins presented a patient for whom he had constructed an all-porcelain bridge as mentioned above. In three years of service no breakage has occurred, and the patient appreciatively commented on the absence of any unpleasant sensation whatever in the mouth.

Dr. Thiersch, of Basel, presented a small collection of plaster models intended to show the usefulness of gold inlays in dental prosthesis. If only one tooth is missing, the space of which is often reduced by the approximation of the neighbor teeth, a gold inlay with exaggerated contours or even an inlay with an artificial dummy furnishes an excellent means of prosthesis. In bridges which are to carry two or even three teeth, the inlays can often be successfully employed as abutments. It has been frequently remarked recently that the inlay technique was difficult, because it made the combination of several fillings impossible without reducing the exactness in their inserting. It has also been said that the anchorage of an inlay is not solid enough to serve as an abutment for a bridge. If, however, all the rules regarding cavity preparation are minutely observed, if an extremely careful technique is followed, the operator, remembering that a gold inlay which carries a bridge must always embrace the teeth on three sides, and, if need be, increasing the stability of the inlay by the employment of pins, can frequently avoid the indubitable disadvantages of a crown abutment by employing an inlay. The essayist showed several models demonstrating the perfect result of practical cases treated after his ideas. He also demonstrated apparatus for the immobilization of teeth that have become loose through pyorrhea.

The entertainment feature was particularly well arranged by the American Dental Club of Paris, which gave a reception followed by a dance in the halls of the Continental Hotel. The attendance of members of the F. D. N. and the F. D. I. gave additional splendor to this fine celebration.

On the morning of Sunday, March 27th, the American Dental Society of Europe attended the inauguration of the monument to Horace Wells. The annual banquet of the American Dental Society

was held on the same Sunday, and was attended by an unusually large number, 105 members and guests. The members of the Executive Council of the F. D. I. had accepted the invitation of the committee, and, sitting between Mr. W. B. Paterson of the F. D. I. and Dr. Godon, Dr. Quintéro of Lyons presided over this beautiful function. Numerous toasts were offered, among which that of Dr. Robinson of Paris deserves special mention; he expounded in an eloquent way the *raison d'être* of the F. D. I.

The administrative session of the American Dental Society of Europe closed the congress on Easter Monday, March 28th, following a banquet which was given by the president to all the members.

The following officers for 1911 were elected at that meeting: Dr. Cooper of Frankfurt, president; Dr. Robinson of Paris, vice-president; Dr. T. G. Patterson of Geneva, secretary; Mr. Frank Day of London, treasurer.

Two other *confrères* of Paris were admitted to the list of officers, Dr. Solbrig (Executive Council) and Dr. Hirschfeld (Committee on Election of Members).

The next meeting of the American Dental Society of Europe is to be held in August 1911, at Dresden.

Special acknowledgment is due to Dr. Quintéro, who presided over this meeting with so much tact and good-will that he may be assured of the hearty gratitude of all who attended.

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PHILADELPHIA, JULY 1910.

EDITORIAL DEPARTMENT.

WHAT NEXT?

WE print elsewhere in this issue the main features of that portion of the "Report upon the Physical Condition of Children Attending Public Schools in New South Wales" in which the condition of the teeth is set forth. In so far as the report indicates the prevalence of tooth decay among school children in New South Wales it does not differ materially in its statistical conclusions from reports of similar investigations carried out in other parts of the world. In short, the evidence that tooth decay among school children is well-nigh universal is pretty nearly conclusive. The report under consideration has, however, extended the inquiry beyond an investigation of the mere question of extent or prevalence of tooth caries into related physical conditions, and it is just that advanced phase of the inquiry which is of especial interest.

In a previous issue we called attention to the fact that the

time had arrived in our study of dental caries from the standpoint of public health where it was necessary to do something more than gather statistics regarding the prevalence of caries. The returns from all countries are sufficiently full and convincing to justify every effort that has been made or that can be made to eradicate this universal menace to public health. The data already at hand with regard to the prevalence of caries and its known effects as endangering the public health, as the forerunner of tuberculosis, as the prodrome of many serious and even fatal diseases, are sufficiently full and striking to furnish all the argument needed to convince health authorities, educators, and those who are concerned with betterment work in its relation to hygienic and social conditions, of the necessity for an aggressive campaign for the eradication of this universal disorder. Our problem today is not the discovery of the condition, but how to cope with it successfully. Are we to apply the patchwork methods of dental art to the relief of this world-wide affection, or are we to go farther, and endeavor to find by scientific investigation the factors which *cause* the disorder, and having found the remedy apply it to the prevention of the disease?

Investigation of the etiology of dental caries has been largely confined heretofore to the study of the more intimate pathological processes concerned in the disorder. We know from the researches of Miller that certain sugar-splitting enzymes produce lactic acid end-products, and that these decalcify the tooth structure, thus affording entrance for other bacteria whose excreta liquefy the organic basis substance of the dentin, the two agencies resulting in the phenomenon which we designate as dental caries. But the subject in its larger aspects has received relatively scant consideration. We do not yet know the cause of dental caries, using the word *cause* in its general and broad significance. We have yet to know the cause of dental caries in such a sense and degree as will enable us to efficiently utilize our knowledge for its prevention. Such knowledge as we now possess is but the stepping-stone to a larger and more complete comprehension of the several factors of the problem, and not until we know more definitely something of the predisposing causes, the factors of susceptibility and immunity, shall we be equipped to efficiently combat the disorder.

Such studies as have been made point strongly to the con-

clusion that caries is profoundly influenced by food habit, and food habit should be taken to include both the kind and the amount of food. Statistics further tend to show that caries is not essentially a filth disease, for tooth decay has been shown to take place independently of oral cleanliness or otherwise. Oral cleanliness may retard tooth decay, but within such limits as are practically available oral cleanliness alone will not prevent caries in a susceptible mouth. The composition of the oral secretions varying with the nutritional state, and this in turn depending upon individual food habit, appears to furnish the most hopeful field of study as to the predisposing causes of tooth caries. Therefore, as we have pointed out in a previous issue, studies of the causes of dental caries among school children will not have large practical value until the dietetic side of the question has been given consideration as an essential factor and carefully investigated in relation to individual cases.

The report from New South Wales introduces certain new and suggestive data, *i.e.* the sex relations of dental caries and the two observed periods of maximum activity of decay. The increased prevalence of caries at the pubertal period would suggest the nervous factor as a modifying nutritional element at that time. The relative frequency of caries among the pupils of urban and country schools respectively is also an interesting and important side-light on the question. The report as a whole, as well as the previous one issued by the same authority, is interesting as the record of an attempt to study the caries question on a broader basis than that of merely securing statistics as to the general prevalence of the disease.

And this naturally leads to another and important consideration. The whole movement, now world-wide in extent, having for its object the combating of this universal defect, lacks organization and unity of purpose, at least as to ways and means. The forces enlisted are of heterogeneous character and varied efficiency. Dental societies, individuals, municipalities, educational authorities, medical organizations, church forces, charitable enterprises, philanthropic bodies, and commercial houses, are all in various ways taking more or less active interest in the work. These severally represent as many different kinds of working *motif*, yet in the last analysis it is the dental profession that will be and is being

called upon to demonstrate what its scientific and practical resources are worth in this crusade against tooth destruction and the health impairment incident thereto. The final result as well as the responsibility for success or failure rests upon the dental profession. It is therefore highly important that a conference of those actively interested in the work should be held at an early date, and full opportunity be thus given for an interchange of views upon and discussion of the fundamental questions that must be solved before the hoped-for success can be attained. The issues at stake are too vitally important to permit the haphazard and ill-directed division of forces now at work to expend themselves uselessly for lack of organized and intelligent direction. Under the efficient leadership of the Dental Hygiene Commission of the F. D. I. the work in Europe is rapidly taking on an organized efficiency in its international aspects, but in America too many unrelated activities are at work to be compatible with the general success of the movement here, and these should be promptly gotten together under efficient leadership —a national bureau, perhaps, which would give direction to the work in its general aspects and act as a clearing-house for the intercommunication of reports of the latest activities and of all literature bearing upon the movement in all parts of the country. Through some such means research could be promoted, suggestions as to the lines of practical examination of school children's teeth be promulgated, and the materials for popular education in dental and oral hygiene be provided. We have reached the parting of the ways, and the question before us is, Shall we progress toward the prevention of dental caries, or shall this great movement die of an acute attack of undigested statistics as to the percentage of decay in school children's teeth?

WHERE PRAISE IS DUE.

In this issue is completed our report of the proceedings at Paris at the recent meeting of the F. D. I., with the connected meetings and festivities. It is only fair to acknowledge that to the excellent arrangements and the generous labors of the F. D. N., under the active and efficient superintendence of its president, Dr. Francis Jean, is mainly due the success of the occasion.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Zeitschrift fuer Zahnheilkunde*, Berlin, January 20, 1910.]

CONTRIBUTION TO THE THERAPY OF PULPITIS—DEVITALIZATION OF THE PULP WITH CODRENIN. By Dr. Knoche, Gotha.

A method of practically painless devitalization is described by means of codrenin tablets, which are sold in the form of small cylinders 3 mm. height and 2 mm. diameter, and are therefore applicable to almost any form of cavity, and consist of cocain mur. 0.01, adrenalin 0.0002. If methylene blue is added, a blue coloring extending to a depth of 3 mm. in softened dentin becomes visible, while in exposed pulps the coloring extends to the apical foramen. The technique of application is exceedingly simple. The carious portions are excavated as far as possible without producing pain, then the cavity is wiped with dry cotton, the tablet laid in the cavity with dry pincers, or, still better, wrapped in a few strands of cotton and then applied, as these tablets dissolve very easily. In central cavities or exposed pulps a pledget of cotton dipped in tepid water is laid on the tablet, and pressed into the cavity until the patient gives signs of pain. If a layer of dentin intervenes, a piece of rubber dam may be spread over the cavity, and then the cotton is pressed in. Very strong pressure is superfluous, and may even cause unnecessary pain. After from one-half to four minutes all sensation disappears, and the softened dentin may be removed with sharp instruments. If the layer of sensitive dentin is very thick, a second or third application may be necessary. No effect beyond the apical foramen has been noted by the author. The extirpation of the pulp is accomplished in the usual way. Dr. Knoche frequently practices amputation of the pulp, removing the crown portion of the pulp, sterilizing with a 2 per cent. tepid solution of chinosol or eugenol, covering the stumps with a dressing of iodoform gauze charged with orthoform, which is sealed in temporarily. If after a week or two the pulp-stumps are covered with sound granulations, and no pus appears in the gauze dressing, the pulp-chamber is filled with a paste of zinc oxid and eugenol, and the tooth once more sealed temporarily. If after four weeks at the most, any untoward reaction appears in the pulp-stumps, anesthetization of the stumps and total extirpation is resorted to. The author claims to have obtained excellent results with this method of amputation, which so far has not been favorably accepted by American dentists. Except in cases of copious formation of secondary dentin, pressure anesthesia with this cocain-adrenalin preparation has proved absolutely harmless, more powerful, safer and simpler, and less painful than pressure anesthesia with pure cocain.

[*Oesterreich.-Ungarische Vierteljahrsschrift fuer Zahnheilkunde*, Vienna, January 1910.]

EXPERIMENTS ON TOOTH IMPLANTATION. By Dr. A. Rothman and Dr. G. Bilskó, Budapest.

The following indications for the reimplantation of teeth are given: If the patient insists upon extraction, but wishes to have the tooth back in the mouth; in nervous patients who will not tolerate any excavating, so that conservative treatment of the tooth in the mouth is impracticable; in cases of excessive sensitivity of dentin that will not yield to any anesthetic; in case of loss of teeth from trauma or faulty attempts at regulation; possibly in hemophiliacs. Reimplantation is contra-indicated in the maxilla below the antrum of Highmore, if there is suppuration, or if the osseous plate is very thin. Of 174 reimplantations practiced in a period of seven years, 86 successful cases have been noted that have been seen after from two to seven years. A great many patients did not present again, and in some cases the reimplanted teeth had to be removed owing to root absorption. In 46 cases of reimplanta-

tion without root-canal fillings a lower percentage of successful healing was noted than in reimplantation of treated roots. Of seven cases of reimplanted roots crowned with Logan crowns, five became firm, one patient demanded extraction, and another did not present again. In all these cases the crowns were put on the teeth before reimplantation. In seven cases of implantation of human incisors that had long before been extracted from other individuals, the roots were generally absorbed after two years, the incisor region being the least favorable for implantation. In nine cases of reimplantation two patients lost their reimplanted incisors owing to impatience after two months, one incisor came out after two years owing to trauma, in one patient of fifty years of age the reimplanted incisor fell out owing to faulty articulation and absorption of the root, but in the remaining five cases the incisors have remained firm for three years. In experiments of implantation of human tooth-roots in the thigh of a one-year-old foal, decalcified roots became as firm as non-decalcified ones. The authors therefore fill the teeth to be reimplanted in the human mouth, under the necessary antiseptic precautions; in some cases, however, the root-canals were not filled, but merely disinfected, but the periosteum was generally left intact. The pain is least when the tooth is reimplanted shortly after extraction. Anesthetics seem to be contra-indicated. If a tooth must be implanted in an already healed alveolus, an artificial opening extending into the bone must be burred, under the application of some anesthetic. In two cases in which no anesthesia was applied, only the soft tissues were painful, while burring in the bone was easily tolerated, care being taken by spraying with cold water not to allow the bur to become warm. In most cases of late reimplantation or implantation severe pain is felt, which generally lasts for eight hours, then entirely disappears save for a slight sensation of paralysis persisting for about forty-eight hours. If the operation is performed between nine and ten o'clock in the morning, the pain lasts till about 5 P.M., and a comfortable night's rest is insured. In some cases, however, the pain may last for from two to three days and more. Teeth with only one root or a conical root are ligatured to the neighboring tooth with wax silk ligatures. In multi-rooted teeth ligaturing is generally unnecessary, especially in the mandible.

[*Journal of the American Medical Society*, Chicago, April 2, 1910.]

IODIN AS AN ASTRINGENT, ANTISEPTIC, DISINFECTANT, AND GERMICIDE IN MOUTH-DISEASES. By E. S. Talbot.

No astringent, antiseptic, disinfectant, and germicide is as convenient and quick-acting as tincture of iodin. Since the mouths of most patients present more or less unhygienic conditions, the gums and teeth should be thoroughly painted, *i.e.* completely covered with tincture of iodin before treatment, Enough iodin should be applied to run in between the teeth and gums, and it should then be allowed to dry; afterward the mouth should be rinsed with water. The author's attention was first called to this method of procedure by his researches on interstitial gingivitis. The pathology of this disease showed the inflammation to be deep-seated throughout the alveolar process. In order to reach this inflammation, iodin alone would penetrate the bone. As the author claims that all people after their deciduous teeth erupt suffer with interstitial gingivitis more or less throughout life, he treats every patient's mouth to an iodin bath before or after operating. This may occur every day, every other day, or whenever the patient has an appointment.

The official tincture of iodin contains 7 per cent. of iodin dissolved in alcohol, to which is added 5 per cent. of potassium iodid. This preparation, if used often, will cause the mucous membrane to become tender and sore; it will also in some patients destroy the mucous surface. To overcome this inconvenience, Talbot many years ago suggested the following formula, which he calls iodo-glycerol:

Zinc iodid,	15 parts
Water,	10 "
Iodin,	25 "
Glycerin,	50 "

—this formula yielding a clear preparation without deposits. As compared with ordinary tincture of iodin, the astringent properties of iodo-glycerol are greatly increased, the glycerin causes rapid absorption, and the irritating effects are reduced to a minimum.

The penetrating effect is remarkable. The glycerin thickens the preparation and prevents it from mixing with the saliva and running over the mouth, as the ordinary tincture will do. Long round wood applicators can be obtained, around which cotton is wound; this is saturated with the preparation, and the gum margins are painted above and below. The jaws are closed, the lips and cheeks distended, and the application is made as before, the teeth being also covered. The lips and cheeks are held away from the jaws until the iodo-glycerol has dried. No other drug will destroy lactic acid bacilli and their ferment and stop caries as well as iodin. Frequent applications will destroy all bacteria in the mouth, and reduce mouth and general disease to a minimum. Before operations in the mouth and fauces, the gums, teeth, and mucous membrane should be given an application of iodo-glycerol, especially in the removal of tonsils. After the iodin has become absorbed, the tonsil or part to be operated on should receive similar treatment. This application should be made from ten to fifteen minutes before the operation. To prevent contagious and infectious diseases among public school children, their teeth, gums, and mucous membrane should be painted with iodo-glycerol once a month during the school term, whereby caries would be greatly reduced.

[*La Odontología*, Madrid, November 1909.]

CHEMICAL AND MECHANICAL ABRASION OF THE TEETH. By Dr. D. Rafael Rodriguez de Aragón.

By abrasion we mean the loss of substance in a tooth produced by the action of either chemical or mechanical agents. If a tooth is placed in a test tube with a solution of hydrochloric acid, a process of decalcification takes place, transforming the tooth into a soft substance composed of organic matter and the elements of connective tissue. In the mouth the acetic and citric acids which are contained in many foods, and the acid-forming putrefaction and fermentation of small particles of food lodged in the interdental spaces, produce decalcification. The saliva gradually assumes an acid character and exerts a destructive influence on the weak points of the teeth, where the enamel protection is thin, as, for instance, at the fissures in the masticating surfaces of the molars, the fissures in the buccal and lingual surfaces of the bicuspids, and especially at the approximal surfaces. Mechanical abrasion is attributed to the wearing down of the enamel by the constant use of a tooth-brush and by the stress of trituration. At first sight it is difficult to establish a differential diagnosis between mechanical and chemical abrasion, especially if present at the necks of the teeth. In both cases the cavity is generally oval. In mechanical abrasion the internal surface is more smooth and polished; in chemical abrasion, where the tissue has undergone chemical disintegration, more rough and rugous. The borders in mechanical abrasion are rounded, in chemical abrasion they are sharp. In the interior of cavities that have been produced by chemical agents, other secondary cavities are found. The color is blackish. In mechanical abrasion, too, sometimes secondary cavities are observed, but their fundus is smooth. As secondary changes in both forms, caries and fracture may occur.

The irritating action of the acid agents produced by the bacteria and the products of abnormal metabolism, acting on the pulp through the dentinal tissue by way of Tomes' fibers, produces a pulpal reaction of defense, an irritation of the odontoblasts, the pulp endeavoring to defend the tooth from the abrasion, this process of defense resulting in the formation of secondary dentin which, according to its appearance on histological examination, is classed as fibrillar, hyaline, cellular, or senile secondary dentin. The last kind of secondary dentin is observed not only in persons past the age of fifty, but also in rhachitics of younger years. The treatment of chemical abrasion consists in neutralizing the acids in the mouth, removing all adhering organic substances from the surfaces of the teeth, especially from the approximal ones. Alkaline treatment is instituted, and bicarbonate and magnesia are administered, the latter preferably in the form of milk. Antiseptics and washings with hydrogen dioxid are applied to destroy the acid-producing bacteria. The superficial erosions are perfectly cleaned, disinfected, and filled in order to prevent any further progress of the disintegration and to avoid future caries or fracture. In mechanical abrasion treatment consists in

forming a cavity, applying some antiseptic, and restoring the tooth by a filling to its normal state.

[*Oesterreich.-Ungarische Vierteljahrsschrift fuer Zahnheilkunde,* Vienna, January 1910.]

RHACHITIC CHANGES IN THE DENTIN. By Dr. L. Fleischmann, Vienna.

It is a well-known fact that rhachitis retards the eruption, *i.e.* the development of the teeth. Little, however, is known about its influence upon the dentin, the main constituent of the tooth. Realizing the close relationship between bone and dentin, and the typical effects of rhachitis on bone, the author has conducted a number of investigations on dentin in rhachitics, and has found that rhachitis produces such typical changes in dentin that they alone suffice for the diagnosis of rhachitis. The first layer of dentin lies over the dental papilla in the form of a small hood, increasing in thickness at the expense of the circumference of the papilla, and downward along it. A short time after the beginning of dentin formation the calcification of the tissue sets in, those portions that were formed first calcifying first. The youngest portion, however, lying nearest to the papilla, remains still uncalcified, so that there is always a small zone of non-calcified dentin present, bordered outwardly by calcified dentin, the extreme apex of the tooth consisting entirely of non-calcified tissue. At the same ratio as new dentin is formed, calcification normally progresses. Formation of dentin and calcification, therefore, are simultaneous processes, the breadth of the non-calcified zone remaining approximately constant. In rhachitis, calcification does not keep pace with the formation of dentin, and the non-calcified zone is therefore broader, especially at the portion of greatest growth of dentin. As the rhachitic process attenuates, the lacking deposition of calcium salts is made up, and a normal breadth of non-calcified zone is established. From accurate measurements of the non-calcified zone of the root-apex, the author has reached the following conclusions: If the non-calcified zone is smaller than 0.1 mm., the tooth is normal; if between 0.1 and 0.2 mm., the case is doubtful; if over 0.2 mm., rhachitis is certainly established. These measurements were taken generally in upper first deciduous incisors. Only in case the development of the root of this tooth was already completed, *i.e.* after three years of age, was the permanent incisor (and in three cases the first molar) measured. In all, 107 cases of children were measured. Another also very frequent though not necessarily constant symptom of rhachitis is the manner of calcification, which normally takes place by deposition of closely placed globules. In rhachitis the calcium globules are smaller and not so densely arranged, producing numerous small interglobular spaces, especially at the growing apex of the dentin. The changes observed in the teeth of rhachitic animals were the same as in man. The development of the enamel is not affected by rhachitis, which simply produces a disturbance in the calcification of the dentin, while the formation and the basic substance of the dentin is normal, the odontoblasts not being influenced.

[*Lancet-Clinic,* Cincinnati, February 5, 1910.]

MOUTH-BREATHING. Editorial.

Although mouth-breathing, from whatever cause it may arise, is a common and pernicious habit, few individuals indeed can be brought to realize and admit it in their own case, and this probably because, during the daytime, talking, eating, and the various avocations direct the attention from the involuntary acts of respiration. The practice is, however, very easily discovered upon awaking after a deep sleep, when the parched throat and the sense of general fatigue indicate the condition in question. The anatomy and physiology of the nasal passages, with their most perfect functions for the purification of the supply of air that is needed to sustain life, will unequivocally convince any intelligent person that so complex a contrivance would not have been provided unless it was intended to fulfil some very important necessities. Besides warming the air before it reaches the bronchi or lung substance, the nasal passages are wonderfully designed to eliminate many impurities, among which may be numbered noxious gases and germ poisons. Indeed, this power of the nasal organization to select the necessary quality and quantity of air is conspicuously shown by our ability to breathe through the nose the poisonous air at the bottom of a well, whereas, if the mouth

be used for breathing, asphyxia almost immediately ensues.

Bronchitis, croup, certain forms of asthma, quinsy, many nervous disorders, besides anthracosis—stone-cutters' disease—have all been attributed to the irritation caused by the pernicious mouth-breathing habit to such a highly sensitive and delicate organ as the lung. No ordinary atmosphere is pure enough to be breathed without undergoing the filtering and tempering process of the nasal passages. This is especially the case in our large, dusty cities, where the habit of mouth-breathing is fraught with great danger to health, particularly to those who are employed for long hours in factories and workshops, the air of which is never clear of floating germs and particles. Premature caries of the teeth due to the absence of alkaline saliva, neuralgia, tic douloureux, irregularities in the conformation of the gums, palate, and teeth are all attributed to the habit of mouth-breathing. Polypi of the nose and enlarged turbinates have also been attributed, and with a good deal of reason, to this same annoying disease. With such a long catalog of ills that arise from a practice that appears so innocent, it is not necessary to insist farther on its immediate abandonment. That it will not be easy to overcome, even though the underlying cause be removed, is not difficult to imagine. But the great benefits of sound and wholesome rest during the night, together with marked improvement in general health that follow the abandonment of such a habit, will repay every effort in the right direction a thousand-fold.

[I.]

[*Deutsche Monatsschrift fuer Zahnheilkunde*, Berlin, March 1910.]

NATURE AND EFFECT OF PYOCYANASE AND ITS APPLICATION IN DENTISTRY. By F. Zimmermann, Leipzig.

[II.]

[*La Stomatologia*, Milan, March 1910.]

PYOCYANASE IN DENTISTRY. By Dr. Luigi Arnone.

In the November 1909 (page 1344), and the February 1910 (page 243) issues of the Dental Cosmos we have directed our readers' attention to the successful application which German dentists have made of pyocyanase in suppurative conditions of the oral organs. The failure of antiseptics and germicides to penetrate into diseased tissue if applied in a concentration tolerable to the tissues has led to a very promising study of the theory of immunity and to the phenomenal success of the serum therapy. The Munich hygienists Rudolf Emmerich and Oskar Loew have discovered bactericidal agents gained by the autolytic method from bacteria, which have been defined as proteolytic or bacteriolytic enzymes or as nucleases, and have the property of dissolving the protoplasm of the bacterial group from which they have been derived. For this reason they have also been called "conform" nucleases or conform proteolytic enzymes. There are, however, classes of bacteria which have nucleases that are not conform, that is, they not only dissolve the protoplasm of the bacteria from which they have been derived, but also that of other foreign groups of bacteria. These are termed heteroform nucleases or heteroform proteolytic enzymes. Pyocyanase represents such a heteroform proteolytic enzyme, which has the property of destroying in a remarkably short time a whole series of bacterial germs without exerting any untoward influence on the organism. Pyocyanase is a bacterial product gained from the bacillus pyocyaneus (bacterium pyocyaneum), the bacillus of the so-called "blue pus." Herr Zimmermann gives a most interesting account of how pyocyanase is gained from bacterial cultures, which for fear of appearing too technical to the average practitioner we only mention in passing. Suffice it to say that the Saxon Serum Works and Institute for Bacterio-Therapy in Dresden dispenses pyocyanase in carefully guarded original bottles which, when the power of the serum has abated, after a year, are exchanged for fresh ones. Pyocyanase is a thick, greenish-brown liquid of high specific gravity with jasmin or glue-like odor and strong, salty, aromatic taste. If the bottle is opened, the serum will keep perfectly for a week and longer.

Pyocyanase dissolves the protoplasm of, and destroys in a very short time, not only a great number of saprophytic bacteria, but also the majority of pathogenic bacteria, especially the micro-organisms of diphtheria, malignant anthrax, typhus, cholera, plague, also streptococci, staphylococci, gonococci, Pfeiffer's micrococcus catarrhalis, and the meningo-

coccus. Besides these bactericidal properties, pyocyanase has the important faculty of dissolving all kinds of pathologic albumin and tissue cells without attacking the healthy tissue; thus pathological exudates, coatings, and secretions, etc., are dissolved or liquefied. This is of the utmost importance, as chemical disinfectants coagulate the secretions so that the micro-organisms are protected against the effect of the disinfectant and can continue to develop. The rapid healing effects of pyocyanase, if applied locally, are based on the following properties: It dissolves the protoplasm of the bacteria, also coatings, membranes, etc.; it favors the restitution of irritated tissue, reduces the raised temperature of the body, and reduces swelling of the mucous membranes and glands.

Experiments with subcutaneous injections of pyocyanase have not yet been completed, but so far bid fair to produce a high degree of immunity. The experiments with local application, either by infusing, painting, dressing, tamponing, or spraying, may be regarded as closed, the author mentioning no less than seventeen extremely favorable reports of different authors, comprising the successful cure of inflammations of the throat, especially diphtheria, septic diphtheria, diphtheria of the nose, angina, especially septic and phlegmonous angina, also angina scarlatinosa, all catarrhal and infectious diseases of the upper air-passages, such as grippe, purulent rhinitis, empyema of the antrum of Highmore, whooping-cough, also meningitis cerebro-spinalis, infected wounds, phlegmonous and ulcerous skin diseases, such as ulcus cruris, panaritium, etc., women's diseases, skin and genito-urinary diseases, such as gonorrhea, inflammatory processes of the conjunctiva, ulcus serpens corneæ and otitis media. Before each treatment the pyocyanase is heated by holding the bottle in warm water. Spraying, even in children, is tolerated very well. Sometimes nausea is experienced on spraying the oral cavity or throat, the patient, however, speedily getting used to the taste. Swallowing does not produce any untoward symptoms, Emmerich and Kulakowsky reporting great success in their treatment of affections of the intestines with this serum when taken *per os.*

In dentistry, pyocyanase has been found to be of great aid in all inflammatory and infectious diseases of the mucosa and gingivæ, especially in the various forms of stomatitis and gingivitis, thrush, aphthæ, etc., alveolar diseases, and principally pyorrhea alveolaris. Before treating any of these diseases with the serum, the teeth are to be cleaned of plaques and tartar, and the mouth must be put and kept in a hygienic condition by rinsing and gargling. Before every application, Reich and Lohmann have the patient thoroughly rinse the mouth with a three per cent. solution of hydrogen dioxid. After some time the mouth is rinsed with tepid water, thereby removing all traces of H_2O_2; then the diseased portions of the mucosa are dried with cotton, and the mouth is kept as dry as possible with cotton rolls. In cases of stomatitis, where large areas are affected, the mouth is sprayed with pyocyanase three times, periods of from five to ten minutes intervening between each spraying. The patient is permitted to carefully spit out the excess of saliva, yet so that a minimum of the serum is removed. Small circumscribed inflamed or ulcerated areas are freely painted by means of cotton, brush, or dropper, repeating twice or three times at intervals of five minutes. In pyorrhea alveolaris two or three teeth are kept dry, and the serum is carried into the gingival pockets by means of a dropper and pumped into the depth with a suitable blunt instrument. The affected portion may also be sprayed in addition. In ulcerated stomatitis, etc., daily treatment is continued until recovery, when it will be advantageous to administer a few additional post-curative treatments. Reich reports perfect cure of serious acute inflammations of the mucosa and gingivæ after two or three treatments within from twenty-four to forty-eight hours. Even in most hopeless conditions due to absolute neglect of all oral hygiene and metallic intoxication, characterized by extremely painful swelling of the entire mucosa, deep and extensive ulceration of the gingivæ, pyorrhea alveolaris, looseness of the teeth, swelling of the submaxillary and submental glands, and considerable disturbance of the general health and fever, in a few days the general condition was improved to normal, and the local conditions rendered tolerable. After a few weeks complete recovery was made.

The author himself reports excellent results in similar more or less serious cases. One case of pyorrhea alveolaris was completely

cured after eight treatments, without subsequent relapse. In one case of an upper right lateral incisor that had become loose owing to purulent pericementitis, with necrotic degeneration of the alveolar septum, the tooth became firm after two treatments administered within a week, and the pus disappeared. Flooding and repeated dressings of putrescent root-canals with pyocyanase also yielded good results, and fistulas closed after from four to five treatments.

Equally good results have been obtained by Dr. Luigi Arnone of Florence, Italy, who presents a most favorable report of seven cured cases of pyorrhea complicated with uricemia and of atrophy of the gums. In the face of these reports, it seems timely that American dentists start experimenting with pyocyanase, unless they wish European scientists to earn all the laurels of a discovery which seems to open up new vistas in the successful treatment of oral disease.

PERISCOPE.

Cutting Aluminum.—Aluminum cuts easily and with a polished surface, if the tool is dipped in paraffin oil.—*Work*, per *Western Dental Journal.*

Paraffin in Gasoline as a Separating Fluid.—Paraffin dissolved in gasoline (saturated solution) makes an ideal separating fluid, it leaving only the thinnest coating of paraffin on the impression, and the model breaking away clean, smoothly, and easily—A. P. KILBOURNE, *Dental Summary.*

Tetanus from Infection of Cavity of Tooth.—Luckett reports a case of tetanus in a child of ten who had very badly decayed teeth, and no other lesion that could allow of the entrance of the tetanus germ. Animal inoculations and culture experiments showed that tetanus germs were present in the tooth cavity.—*Med. Record*, per *Journ. of Amer. Med. Association.*

Differential Diagnosis of Syphilitic Mucous Patches from Other Affections of the Mouth.—The characteristic syphilitic mucous patch is readily differentiated from other benign affections to be found in the mouth, but under certain conditions the differential diagnosis may become extremely difficult. Mercurial ulceration is one of these, and may cause the most expert to hesitate before pronouncing his verdict. In ulceration due to mercury, however, one almost always finds a lesion on the cheek or gum behind the last molar, usually the upper on one side, or in the immediate neighborhood of the upper or lower central incisors, usually the upper. In the latter situation the gums are often retracted and intensely painful, interfering with mastication, so that the patients often refuse to take food. Other evidences of salivation may also be present to confirm the diagnosis, though the mercurial ulcer may occur without salivation. The ordinary aphthous erosions frequently accompany syphilis, and very closely imitate the small superficial syphilitic ulcer. They are, however, always very painful, in contra-distinction to the syphilitic lesion. The common condition of herpes may cause confusion, but the lesions are individually much smaller, are more frequently arranged in clusters or groups, and have small polycyclic borders. Thrush and diphtheria are also to be considered as factors in making a differential diagnosis.—O. H. FOERSTER, *Dental Review.*

Regulating Extremely Constricted Upper Dental Arches by Stationary Anchorage.—In the treatment of extremely constricted upper dental arches stationary anchorage offers advantages over the usual methods of expansion. Not only is the degree of outward tipping of the buccal teeth very much reduced, but the tendency to develop increased nasal capacity is without doubt increased. In the employment of elastic force, control may, in the majority of cases, be maintained by so adjusting the appliance that the elasticity will have spent itself by the time the desired movement is effected. When rubber elastic bands are used, the strength of the pull may be closely gaged by selecting bands of suitable size. In many cases where rapid movement is desirable, and extra force is resorted to for its accomplishment, the extent of movement may be regulated by pla-

cing a little lug or spur or hook in such a position on the moving tooth that when the desired position has been reached, the spur or hook will engage some other part of the appliance, and thus make further movement impossible. Little devices of this nature are always suggested by the exigencies of the case under treatment; whether or not they are successfully met depends upon the judgment and ingenuity of the operator.—F. C. KEMPLE, *Items of Interest.*

Molar Clamp Band.—The molar clamp band should be made with a lap so that the cement may be perfectly inclosed upon the tooth surface to prevent detritus from being retained between the lingual screw and the tooth, predisposing to caries. The buccal tube is short, without a friction sleeve, and is gaged as to its internal diameter so that the expansion arch fits somewhat snugly.—H. A. PULLEN, *Dental Summary.*

Preserving Dental Cements.—Both powder and liquid of dental cements deteriorate by exposure to the air, or by the introduction of any substance foreign to their composition. To prevent deterioration, the liquid should be transferred to an "office preparation bottle" when the original bottle is first opened, and the liquid removed for use each time with a small drop tube. Both powder and liquid should be kept tightly corked at all times.—T. E. WEEKS, *Garretsonian.*

Points in Casting Pure Aluminum Plates.—Two cautions are necessary for a successful casting. (1) The waxed model must be within a half or five-eighths of an inch of the bottom of the flask, and (2) the investment must be thoroughly dry, as the slightest amount of moisture left in the investment will produce a porous plate. The vacuum method gives a smoother and denser surface than any other method known to us at present.—W. H. TUTTLE, *Western Dental Journal.*

Cold Water Before Taking an Impression for an Artificial Denture.—If the patient is already wearing an artificial denture, have him rinse out the mouth with cold water. In a warm mouth the tissues are expanded, and by contracting them a smaller impression is obtained. If the patient has been wearing a plate, and an attempt is made to take an impression immediately after the plate is removed, the impression will not be as accurate as if cold water is used.—J. P. RUYL, *Items of Interest.*

Final Finishing of a Cast Gold Inlay.—After seeing that occlusion and approximal contact are correct, hold the inlay firmly in position with an instrument in the left hand, or let your assistant hold it, and with suitable instruments burnish firmly all edges to the peripheral walls. Then remove and polish it with disks and the laboratory lathe wheels, keeping away from the edges. Then cement the inlay to place and again go over the edges with burnishers, before the cement hardens. The final polishing is done after the cement has hardened.—J. D. PATTERSON, *Western Dental Journal.*

Matrix Preparation for Porcelain Inlays.—Platinum is first thoroughly annealed in an electric furnace to obtain as much softness and pliability as possible. A piece of generous size is then taken, allowing enough overlap to be able to hold the matrix firmly with the fingers.

The matrix is started into the cavity with the ball burnisher. A piece of cotton binding tape one-half inch wide is then wetted so that it will stretch down into the cavity. This is pulled tightly over the matrix and cavity, and the burnishing completed with suitable burnishers, burnishing over the cotton tape. The tape holds the matrix at all points and prevents rocking, and also holds an even tension over the surface of the platinum, preventing the burnishers from puncturing it. In this way matrices can be made absolutely free of all wrinkles, and are seldom torn or punctured to any extent.—W. W. MCKAY, *Items of Interest.*

Points in High-Pressure Anesthesia.—Do not use too much pressure nor have too much of the cocain solution in the syringe; usually from one to three drops is all that is necessary to produce anesthesia, any more being dangerous. If the cavity is unfavorably located, I do not hesitate to drill the pit at the most accessible, inconspicuous location; often this is the better plan, as when we have more than one cavity we can close the pit temporarily, using it as a point of injection over and over.

Immediate root-filling is not advisable, as we usually have more or less profuse hemorrhage following the removal of the pulp by this method. Soreness is often caused by a blood-clot, due to checking hemorrhage too soon, and for this reason I think we should rather encourage the flow of blood instead of stopping it with styptics or adrenalin. Of course, throughout this method we should observe asepsis.—R. H. WELSH, *Dental Summary.*

Setting Gold Inlays.—The approximal surface is polished with a sandpaper disk, and then finished with cuttlefish. The margins are left with a slight feather-edge, and while the cement is soft, they are burnished with a flat burnisher along and over the margins. I aim by this procedure to make a more perfect joint, squeezing out any excess of cement, and preventing the cement line, which is so objectionable. The occlusal surface of the inlay is finished in the same manner, except that, instead of using a burnisher, it is ground with small stones, always in the direction of the margins. I believe that in this way a more perfect filling is produced. After the stoning, of course, the filling is polished in the usual way.—T. P. Hinman, *Western Dental Journal.*

Syndrome from Non-eruption of Teeth.—Pfister reports three cases to show the disturbances liable to follow when the molars are not normally erupted. The jaw is generally swollen, and this swelling may persist for years, and there may be pain for which the patient is liable to consult the neurologist rather than the dentist. The symptoms may simulate a cancerous growth, but a radical operation is not required; resection of the outer wall of the cyst and tamponing for a few days or opening a passage through the bone for the tooth, generally prove sufficient. As a rule the disturbances develop between the fifteenth and thirtieth years. The diagnosis is rendered certain by Roentgen-ray examination.—*Deutsche med. Wochenschrift,* per *Journ. Amer. Med. Association.*

Pin-Locked Cast Gold Inlays in Abutment Teeth.—Since the advent of casting methods and the more frequent use of gold inlays, the utilization of such inlays for securing one or both ends of a short bridge has become more and more practicable. In some cases, more especially in the presence of living pulps, it is desirable to use a pin in connection with an inlay, in order to attain greater security. When two such abutment inlays are used, and both carry pins, it is often found to be difficult to set the bridge after assembling the parts, because of the difficulty of having the pins parallel. Moreover, it would be more desirable to have the pins at a tangent, if this were possible. I therefore conceived the idea of having the pins separable from the inlays, and so constructed that they may be inserted at the time of cementation.

The technique is as follows: After properly preparing the cavity, the wax inlay is made, and an iridio-platinum pin set in the usual way. The pin is then slightly warmed and removed, and in its place I introduce a carbon pencil point of the same gage. I have these carbons of various sizes, from 15 to 20 gage. Sometimes I cut a thread on the carbon to make them remain more securely in the wax, but quite as often I simply roughen them. When the inlay is cast, I remove the carbon, inserting in its place an iridio-platinum pin. I then make an extension into the tooth of the same gage as the pin. This is an advantage, as by this means the little hole which is to receive the pin may be drilled into the tooth after the casting is made, which may be done very accurately.

In setting the bridge I use cement, also for seating the pins, which are driven securely into position, their excess being ground flush with the occlusion. It may be an advantage in some cases to thread the pin and then to tap the hole through the inlay, and even into the tooth itself, thus making it possible to screw the pin into place.—C. B. Reynolds, *Items of Interest.*

Treatment of Alveolar Abscess in Deciduous Teeth.—The treatment of alveolar abscess in deciduous teeth presents but one difficulty, that of enlarging the cavity and gaining access to the pulp-canal. The tooth being tender to pressure and the vibration of a bur being painful, the amount of cutting at the first sitting is usually limited to a minimum. As large an opening as circumstances will permit should be made into the pulp-chamber, followed by continued injections of a hot antiseptic solution. This is especially desirable, not only for mechanical cleansing, but it will be remembered that the end-products of putrefaction are soluble in water, and this procedure is a valuable adjunct in clearing the field for medication. The hot solution should be followed by hydrogen dioxid, used chiefly for the mechanical effect. With small hooked broaches, the canals are opened and cleansed to a depth of about 1 mm. Glyco-formalin is recommended as a dressing, because formalin is less irritating in this combination than in any other formula. The above treatment is repeated in four days. At this sitting the canals should be opened and cleansed, the depth to which to insert a broach depending on the age of the patient. For instance, at six years, the roots of the first deciduous molar have just commenced to absorb, the central incisor root about two-thirds, the lateral one-half; the canine and second molar roots are intact. At this second sitting, after the

canals have been cleansed, they are pumped full of glyco-formalin, the tooth is sealed and the patient dismissed for another four days. At the expiration of that time most cases can be safely filled. Occasionally an old chronic case refuses to yield to this strength of medication, and then instead of glyco-formalin, Dr. Buckley's No. 2 formula is used, consisting of tricresol two parts, formalin one part. Greater care must be employed in confining this dressing than the former, and it should never be permitted to come in contact with the gums or mucous membrane. Obstinate cases are readily healed under the influence of this powerful disinfectant, and usually but one application is necessary.—A. D. Kyner, *Dental Review.*

To Make an Anatomically Correct Gold Crown.—The root is prepared in the usual manner, making a band of pure gold plate, 32 gage, to fit the root. A top is soldered on the band, leaving a little space between the top and the root, for in casting cusps there is a slight raising of the cusp, and it is necessary to push the finished crown a little more under the gum margin. An impression and bite are taken in the usual manner, and mounted on the articulator. Warm inlay wax is placed on the tooth, and the articulator is closed for obtaining occlusion, the wax is built around the gold, bringing it from the gum to the contact points, bulging at the middle third buccally and lingually. The whole is then carved to proper contour, invested, and cast. This crown will not take much more time than a well-contoured crown, and while it will require more gold, will also permit of a larger fee.—B. Jones, *Texas Dental Journal.*

Anchorage in Regulating, and Its Different Forms.—The different forms of anchorage employed in regulating teeth that have been conveniently classified by Dr. Angle may be briefly defined as follows: A simple anchorage is one in which the form of attachment to the anchor tooth admits of the latter being tipped in its socket when force is applied. In stationary anchorage a rigid attachment is made to the anchor tooth, which as nearly as possible prevents its tipping. if it is displaced, it must be moved bodily through the alveolar process. Reciprocal anchorage is the tipping of one malposed tooth against another in such a manner that, when force is applied, the tendency is to move both teeth into proper occlusion. The word "reciprocal" as here used does not mean "equally resistant to the force applied." Usually, one of the teeth will move with much greater ease and rapidity than the other. It would only be by rarest chance that two teeth could be found whose resistance to the moving force would be exactly equal or equally reciprocal. In occipital anchorage the top and back of the head is utilized as the source of resistance. This is perhaps the only anchorage used in orthodontia that is not liable to displacement when force is applied. Occlusal anchorage depends for resistance upon the force of occlusion of the antagonizing teeth. Dr. Calvin S. Case describes what he terms "sustained anchorage" as one in which a single tooth, standing alone, is supported in such a way as to maintain its upright position. Such a condition would be included under stationary anchorage.—F. C. Kemple, *Items of Interest.*

Hygiene of the Mouth.—Herrenknecht reviews bacteriologic research which shows that the normal bacterial flora in the mouth protects against the invasion of pathogenic germs under normal conditions. The bacteria do not injure the teeth unless their products are allowed to accumulate, in which case the acids generated by the bacteria cause the destruction of the teeth. The main point in the care of the teeth is therefore to insure the mechanical removal of these products and everything that may serve as nesting-places for the bacteria. The most important measure is to rinse out the mouth with water or a weak salt solution; warm water is much more cleansing than cold. No bactericidal drugs are needed; they do direct harm, as they injure the tissues; all that is necessary is the mechanical, forcible rinsing-out of the mouth several times in succession after each meal. If a mouth-wash is desired to aid in cleansing and to leave a refreshing taste in the mouth, he prescribes a mixture of 0.2 part saccharin and 0.3 part peppermint oil in 100 parts of alcohol. From 10 to 20 drops are to be added to a glass of warm water, and the whole amount is used to rinse the mouth. He rejects tooth-powders, as their hard particles are liable to injure the teeth. Soap also has an injurious action. He advises having the teeth inspected several times a year after the age of three, and protests against extracting a molar or bicuspid in a child's mouth; if absolutely necessary, the antagonist should be also extracted. This should be the rule up to the age of eighteen; the jaws will then develop symmetrically. Adults should have their teeth examined twice a year and in some cases oftener.—*Muenchener med. Wochenschrift,* per *Journ. Amer. Med. Association.*

Leucoplakia and Its Dangers.—The most important point in connection with leucoplakia is its prognosis, for only too often the leucoplakia patch represents the ground that is favorable for the later development of carcinoma, with its hopeless ending. Some cases last for years without developing a malignant change, while others show this change relatively early. In undoubted syphilitic cases the prompt employment of energetic treatment should be resorted to in order to prevent such chronic changes as will render a cure impossible.—O. H. Foerster, *Dental Review.*

Cast Aluminum Plates.—Aluminum castings can be made in the same investment as gold inlays, but I get better results from a coarser investment, and for this purpose I use red bird-gravel, which may be purchased at any drug store. This is mixed in the proportion of three of gravel to one of model plaster. The cast is made of the same material, and if a vacuum chamber is needed, it must be cut in the impression. The plate is waxed in the usual way, with the following additions: A rim is placed on the labial and buccal edges, and another a short distance inside the center of the ridge. The space left in these rims is spurred for the retention of the rubber. A roll of wax one-quarter inch in diameter is carried across the plate from ridge to ridge, and another from the ridge at the median line to meet it. The union should be at the center of the plate, and at this point a wax sprue is placed, the same diameter as the cross-piece and one-quarter inch long. When the plate is ready to be invested, place the cast in water and allow it to absorb all it will take up. The investment material is mixed, using the same as for the cast, and a quantity is poured on a glass slab. The cast is placed on this and pressed down, allowing one-quarter inch of investment to remain between the cast and the slab. With spatula and brush cover the cast until nothing remains showing but the sprue. Partially fill the cup with the same mixing, and while this is still soft carry the cup over the cast until it rests on the slab. The excess is forced out at the bottom and top of the cup, and should be removed from the top opening until the wax sprue is exposed.

The mold is prepared for casting in the same manner as for an inlay, except that it takes more heat and longer time on account of its size. Borax should not be used in melting, as it is injurious to the metal, but an occasional stir with a small stick will aid in bringing the metal to a fluid condition.—R. Seymour, *Items of Interest.*

Hints, Queries, and Comments.

CONGENITAL DEFORMITY OF THE MOUTH.

Mrs. O. brought her daughter, twelve years of age, to ascertain what could be done to remedy the deformity of her mouth. This deformity was evidently congenital, and the most conspicuous case of its kind ever observed by the writer. Mrs. O.'s incisors were unusually large and long, and exposed two lines, and she had trained her lips to a fixed position to cover at least two more. The daughter's canines projected over the lower lip, and were exposed three lines; the lip barely covered the gums over the lateral incisors. There was an exposure of the gingival margin over the centrals of one line. The projecting teeth were entirely free from contact with the lip or chin when the mouth was closed. There was but one thing to do, and that was to extract the six teeth and excise the alveolar process preparatory to supplying an artificial denture. The girl became panic-stricken and refused to submit to the operation, our arguments availing nothing. It was with difficulty that she was persuaded to have her condition examined, as she had been very sensitive to criticism from early childhood. Impressed, however, with what could be done to improve her appearance, the girl's pride finally conquered, and after two or three months she came to the writer's office early one morning, took a seat in the chair, and asked to be operated on. She calmly submitted to the extraction of the six teeth, and after the hemorrhage had subsided, the excision of the alveolar process was quickly executed. The excision was

made along the line of union of the mucous membrane of the lip with that of the gums. Beginning on the right, the grasp of the osteoclast included three lines of the tissues, and the increase in width to the median line amounted to seven lines—as the process markedly dropped. After the hemorrhage had abated the abraded surface was laved with the following solution:

℞—Zinc. chlorid.,
Acid. carbol.,
Ol. cassiæ, āā ℥j
Aquæ puræ, ℥j
Alcohol, āā ℥j

Prescription of ℥j boracic acid, for an amount to be applied with the finger after each meal.

As the patient was anxious to get the teeth, she was dismissed for a week. The healing process was most satisfactory. On the third day afterward the teeth were placed in the mouth. The transformation in the patient's appearance produced a most surprising effect. The deformity, which had been sufficient to debar her from society, was changed completely, and the girl appeared quite comely. She at once started to school, entering classes of her age, after having been taught by her family. She married a few years later, and as far as the writer knows, is still wearing that plate. Nature produces some inexplicable deformities now and then, some hereditary, others mysterious as to causation.

R. J. Porre, D.D.S.

Cincinnati, Ohio.

OBITUARY.

DR. CHAS. HAMMOND DARBY.

Died, at his home in St. Joseph, Mo., May 14, 1910, Charles Hammond Darby, D.D.S., as the result of an attack of pleuro-pneumonia.

Dr. Darby was born at Greene, Chenango county, N. Y., July 2, 1843. He was the son of Rev. Chauncey Darby, a Baptist clergyman of that town. He received his early education at Cortland Academy, Homer, N. Y., and afterward took up the study of dentistry with Dr. Ransom Walker of Owego, N. Y. After completing his period of studentship under his preceptor, he opened an office for the practice of dentistry in Fairfield, Iowa; here he continued for one year, and then removed to St. Joseph, Mo. In 1866, while still retaining his residence in St. Joseph, he returned East to pursue his studies at the Pennsylvania College of Dental Surgery, from which institution he was graduated in 1867, when he returned to his office in St. Joseph and continued in practice there for forty-three years and until the time of his death.

Dr. Darby married Mrs. C. S. Hawks, widow of Bishop Hawks of the Episcopal diocese of Missouri. By this union he had one daughter, who, with his widow, survives him.

Dr. Darby was a remarkable character both in private life and as a practitioner, a splendid example of that sturdy New England stock which has had such a pronounced formative influence in shaping the type and characteristics of our American civilization, and which has contributed so much to our development and progress as a nation. Those elements of character with which he was naturally endowed were further strengthened by the wholesome home influences with which his early youth was surrounded, and the character-developing early education which he received in a typical New England preparatory school. These influences served to emphasize and develop the principles of justice, of integrity, of fair dealing, of righteous living, which were his natural heritage—principles which ever after characterized all of his activities in their relationship to his family, to his friends, and to his fellow man. His force of character instantly impressed itself upon all who met him for the first time. Aggressive, if need be, yet his forcefulness was always counterbalanced by his

gentleness, his aggressiveness was tempered by his love for justice and sense of equity, and his whole character was dominated by his genuine love of humanity. These qualities assured to him the confidence of those who constituted the community in which he lived, and the noble qualities of his heart, his friendliness, his generosity, his affection for his friends, endeared him to all who were admitted to the inner circle of his friendship. Few men have been privileged to attract to themselves a greater number of those who can in the larger sense be characterized as friends, and to those particularly, as well as to his large and satisfied professional *clientèle*, his death comes as a heavy loss.

A sketch of Dr. Darby would be lacking in completeness and accuracy were not some reference made to his humorous sense, which was one of his strongly marked attributes. The quality of his humor was in some respects not unlike that of the late Mr. Clemens in that it never descended to sarcasm nor ridicule, but seemed to always possess something of a philosophic basis. Many of his sayings of humorous character were wholesome truths dressed in the merry garb of the jester, and nearly all of his humorous utterances compelled his hearers to think seriously as well as to laugh. The following are some instances among the many of his sayings which are worthy of preservation: "There is a big difference between fellowship and friendship." "My idea of a true friend is not one who pats you on the back and congratulates you in prosperity, but one who is willing to lie down with you in adversity and who seeks to lessen your burden." "Dignity of character, etc., are superfluous classifications—they are all covered by the one word 'decency.'" "Do not underestimate the country dentist; he may not always have the polish, but he generally has the patients." "I am always glad to welcome the dentist, no matter how crude he may seem, who visits my office seeking ideas for his professional betterment, for he is liable to leave more than he takes away." His humorous and his philosophic sense were a direct inheritance from a gifted mother and an equally clever grandmother, and the brilliancy of the conversation at times when the subject of this sketch, with his brother, Prof. Edwin T. Darby, or his cousin, Dr. Frank Darby of Elmira, N. Y., met in family reunion are matters of family tradition.

A life-long friend of Dr. Darby, Judge O. M. Spencer, said of him: "He was a cheerful spirit, with a friendly greeting under all circumstances wherever met. He possessed a rare taste in all things which go to make a gentleman and a royal comrade. He loved his profession for the work's sake, so much so that he hastened his end by overwork. His generosity was great. He carried his share of all burdens, and would not only divide his last cent with a friend, but even with a stranger in need."

Dr. Darby was a member of the National Dental Association, the Missouri State Dental Association, and the Odontographic Society of Kansas City, and was at one time president of his state society. His closest professional friendships were perhaps included within the membership of the Odontographic Society of Kansas City, which organization, a year ago, signalized its appreciation of him by presenting him with a handsome token of their regard, the cordial sentiment of appreciation held for him by all the members being set forth in the presentation speech made on that occasion by C. L. Hungerford of Kansas City, who, among other things, said: "But especially I want to call your attention to the fact that we also have other men at whose feet we have sat for wisdom, men whose long lives have been devoted to the practice of their profession, who have made progress, and with whom we have been associated for many, many years; one especially, among them, who is thought of and known in familiar parlance as the 'Old Aristocrat.' When that term is mentioned we think of Dr. Charles H. Darby of St. Joseph—a synonym for all that is comprised within the word 'gentleman,' all that a gentleman can be—synonymous with all the good and gracious forces that flow through men's hearts and minds and make their lives profitable to themselves and a benediction to all with whom they are associated."

DENTAL COLLEGE COMMENCEMENTS.

CREIGHTON DENTAL COLLEGE.

THE annual commencement exercises of the Creighton Dental College were held April 30, 1910, in the Brandeis Theater, Omaha, Neb.

An address to the graduates was delivered by Hon. Martin J. Wade of Iowa City, Iowa.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

J. Ballard	R. S. Cutler	C. H. Heyne	M. M. Mach	H. J. Parmenter
C. E. Bolzell	M. S. Dunshee	J. Jackson	H. Mitchell	E. J. Perley
W. G. Brown	C. Emerson	W. Ludden	J. A. Moran	P. E. Rasmussen
C. S. Corfmon	M. I. Gordon	J. McAvin	C. Morton	

MEDICAL COLLEGE OF VIRGINIA, DENTAL DEPARTMENT.

THE annual commencement exercises of Medical College of Virginia, Dental Department, were held May 18, 1910, in Richmond, Va.

An oration was delivered by Dr. Lyon G. Tyler, president of William and Mary College.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

J. H. Cocks	Virginia	P. B. Walton	Virginia
C. C. Vaughan	Virginia		

OHIO COLLEGE OF DENTAL SURGERY.

THE sixty-fourth annual commencement exercises of the Ohio College of Dental Surgery were held at the Odeon, Cincinnati, Ohio, May 12, 1910.

Addresses were delivered by Wm. P. Rogers, A.B., LL.D., dean of Cincinnati Law School, and Howard T. Moore.

The degree of Doctor of Dental Surgery was conferred by Hon. Herbert Jenney, president of the board of trustees, on the following graduates:

Malcolm G. Adams	Virginia	Walter H. McClung	Kentucky
Lawrence C. Cummins	Ohio	Howard T. Moore	Ohio
Dennis J. DeLaCroix	Ohio	Herbert R. Myers	Ohio
George P. Fitzgerald	Pennsylvania	Thomas W. Neeham	Ohio
Howard P. Flesher	Indiana	James T. Nickell	Kentucky
Jonathan E. Gibson	West Virginia	William H. Nicholson	Rhode Island
Orian R. Hedrick	West Virginia	Esther E. O'Neal	Ohio
Dave L. Hickey	Kentucky	William S. Rice	Kentucky
J. Leslie Hill	Illinois	Ellsworth W. F. Risch	Ohio
William H. Hoblitzell	West Virginia	George J. Ross	Kentucky
Harry C. Holton	Kentucky	Frank G. Sheppard	West Virginia
Francis S. Keller	Ohio	Everett E. Stewart	Ohio
Ross W. Kibbee	Indiana	Forrest W. Ward	Ohio
Wellington B. MacBain	New York	John H. Wood	Kentucky

UNIVERSITY OF PENNSYLVANIA, SCHOOL OF DENTISTRY.

The annual commencement exercises of the University of Pennsylvania, School of Dentistry, were held June 15, 1910, in the American Academy of Music, Philadelphia, Pa.

An oration was delivered by Hon. Philander C. Knox, Secretary of State of the United States.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Ernest Andrew Abbott
Frank Clifford A'Court
Birger Anderson
Edward Sinclair Andersen
Albert Milne Applegate
Walter Thomas Arms
Malcolm Penquin Astley
Thomas Dodd Bailey
George Francis Baker
Henry Oxley Bateman
Walter Albert Beams
Berton Elmer Beck
Byron Stanley Behney
Edward Harney Bell
Thomas Bell
Reinhardt Paul Bender
Harvey Wilcox Bentley
Frank Wilkinson Berkhimer
Cecil John Burge
Victor Charles Burt
Herman de Castro
Marco Tulio de Castro
Ruben Castro
Howard Alonzo Cheney
Daniel Henry Cloutier
Lynn Rosevear Cole
James Jacob Conran
Leonard Marshall Crockett
Ernesto Solis Crocker
Eldon Lewis Crowell
William James Crowley
John Francis Curran
Joseph Emerson Davis
Laurence Bret Day
David Philip Dear
William Clyde Decker
Clarence Stoudt De Long
Archibald R. Fulton Douglas
Jan H. van Heemskerck Düker
Charles Francis Egan
Ralph Embler
Albert Wm. Backwell Fenn
Julius W. H. J. Fielder
Ernest Philip J. Friederich
Henrique Feio Galvao
Ernest Charles Gierding
Karl Glaser
Freas Marion Golder
Julius Goldsmith
Frank Hannibal Graham
Milton Franklin Graver
John Havelock Gunter
Robert Joseph Haley
Victor Hallenberg
Joseph Thomas Ham
Cloyd Summerfield Harkins
Forrest Mayes Harrison
Ludolph T. A. van Hasselt
Leo Paul Haywood
Robert Harold Heath
Octave Napoleon Hebert
Daniel John Hennessy
Samuel Herder
Luis Carlos D. Hernández
Jerome Evan Hirtle
Benjamin F. Hohenshilt
Harold Brainerd Holmes
Thomas Aloysius Holton
George Taverner Hoyes
James Thomas Ivory
Johannes Jacobsen
Edward George Jones
Frank John Kelley
Daniel Joseph Kelly
William Carpenter Kelly
Stuart Theodore Ketcham
Isadore Harold Knopf
Otto Paul Koch
Howard Samuel Koontz
Victor Labarraque y Arnaud
Poul Lange
Frank Henry Lantier
Clarence Henry Lash
John Law
Emerson John Le Houllier
Nathaniel Henry Leiken
Alfred Isak Levin
Charles Walter Lewis, Jr.
Gustav Johannes Lind
Theodore Kent Lindstedt
Murray Kingsley Litchfield
Millard Bean Long
Orville Smith Long
Gustav August Lüder
André Joseph Lugand
George Hill McElhone
John Warren Manning, Jr.
Ernest Sidney Martin
Vincent Timothy Meaney
Duncan Pryor Meikle
Frank William Meter
William Harrison Moffatt
Edmond Felix de Monseigle
Henry Adams Motchman
Byron Ellsworth Noyes
George Abel Nutter
John Robert O'Brien
William Blaine Oliver
Wilton Colt Paull
Hermann Pauson
George Edward P. Philpots
Severin Pinkasfeld
Hugh Graham Pipes
Lemuel Eastburn Potts
Peter Carvey Pulver
Abraham Raffman
Ira Miller Rapp
Samuel Alexander Richards
David Stephen Roberts
Harry Louis Rosenbaum
Joseph Rubin
Frank Henry Salter
Samuel Rutherford Sawyer
Gerald Frederic Schaffner
George Norton Serre
David Scull Smith
Charles Victor Snyder
Arthur King Stebbins
Simeon Aaron Steeves
Edward Courtenay Stillwell
Fred W. Stoddard
Hugo Karl Strobel
William Everett Strous
Rupert Ingram Sutton
George W. Taylor
Walter Dee Thomas
Alva Clarke Thompson
Arthur George Trott
John Coe Vandervoort
Victor Roy Wagner
Charles Aloysius Walsh
John Leo Weiler
Joseph Weinberger
Walter Henry Welch
William Henry Weston
Carroll Byington Whitcomb
Charles Ralph Wilson
Ernest Charles Winstone
Horace Stephen Woolston
Emil Zauber

UNIVERSITY OF MEMPHIS, COLLEGE OF DENTAL SURGERY.

THE first annual commencement exercises of the College of Dental Surgery, University of Memphis, were held May 12, 1910.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

L. J. McRae ..... Mississippi
Z. C. Mims ..... Alabama
J. C. Wier ..... Texas

BALTIMORE MEDICAL COLLEGE, DENTAL DEPARTMENT.

THE twenty-ninth annual commencement exercises of the Dental Department of Baltimore Medical College were held in the Lyric Theater, Baltimore, Md., May 26, 1910.

The degree of Doctor of Dental Surgery was conferred by Prof. S. K. Merrick, M.D., president, on the following graduates:

Edgar G. Adams ..... Connecticut
Nathan M. Berkwitz ..... Connecticut
Jacob N. Blumenthal ..... Connecticut
Chas. A. Cohn ..... Pennsylvania
Maurice E. Connors ..... Massachusetts
Clarence B. Diamond ..... New Hampshire
Clarence A. Finkle ..... New York
Walter L. Garrett ..... New York
Frank H. Holley ..... Massachusetts
Francis W. Johnson ..... Canada
Edwin W. Malone ..... Maryland
John Martin ..... New York
Wm. E. Norton ..... Connecticut
Eugene W. O'Brien ..... New York
Bernard L. Riley ..... Vermont
Frederick C. Shaw ..... New York
Walter B. Spencer ..... Connecticut
Rudolph H. Vadenais ..... Rhode Island
Wm. R. D. Wilkes ..... Canada
Fred E. Wilson ..... New York

LOUISVILLE COLLEGE OF DENTISTRY.

THE annual commencement exercises of Louisville College of Dentistry were held in MaCauley's Theater, Louisville, Ky., May 16, 1910.

An address was delivered by Col. Bennett H. Young.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

John Adkins ..... Kentucky
Edward Gammell Allison .... North Dakota
Jesse Baucum ..... Kentucky
Harry Taylor Bauer ..... West Virginia
Martin Felix Bomelaski ..... Indiana
Charles Bunyan Bray ..... Mississippi
Ura Marvin Bryant ..... Kentucky
Samuel Cawood ..... Kentucky
G. L. Coffey ..... Tennessee
P. H. Conover ..... Kentucky
Otto Cubbage ..... Kentucky
H. A. Day ..... Oregon
J. E. Dean ..... Kentucky
Charles DeWitt Deyton ..... N. Carolina
J. L. Douglas ..... Texas
Oscar Flener ..... Kentucky
A. W. Guillory ..... Louisiana
J. E. Hargis ..... Mississippi
F. G. Hendershot ..... Ohio
K. W. Hester ..... Kentucky
A. W. Hickerson ..... Kentucky
J. W. A. Hoskins ..... Virginia
James Wm. Hoskins ..... Kentucky
Lafayette Earl Lawson ..... West Virginia
R. F. Lee ..... Illinois
E. E. Metzger ..... Indiana
Arthur Earl Norton ..... Ohio
Miles Edward Osburn ..... Kentucky
R. H. Peak ..... Kentucky
W. H. Puryear ..... Kentucky
C. L. Rice ..... Alabama
F. W. Rounds ..... Maine
E. R. Shipp ..... Kentucky
J. A. Spalding ..... Kentucky
James W. Sears ..... Kentucky
Fred Shively ..... North Dakota
G. M. Stafford ..... Kentucky
W. B. Taylor ..... Kentucky
Chester Tyree ..... Kentucky
C. H. Tinsley ..... Kentucky
L. P. Tuttle ..... Kentucky
A. B. Waddle ..... Kentucky
F. M. Wadsworth ..... Minnesota
Earl Stewart Washburn ..... Alabama

TEXAS DENTAL COLLEGE.

The annual commencement exercises of the Texas Dental College were held in Houston, Texas, on May 19, 1910.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Miss Alice F. Attaway	Hubert Davis	William L. Sandell	Jno. D. Tomme
James F. Barton	Jno. H. Edwards	M. E. Sanders	Chas. E. Tribe
Charles Louis Cromwell	William J. Knight	W. Register Sivley	Jno. Fred Usner
Harold A. Daniels	Palmer P. Murdock	Arthur A. Stripling	

COLLEGE OF PHYSICIANS AND SURGEONS OF SAN FRANCISCO, DENTAL DEPARTMENT.

At the annual commencement exercises of the Dental Department of the College of Physicians and Surgeons of San Francisco, held in May 1910, the degree of Doctor of Dental Surgery was conferred on the following graduates:

Theobald T. Bergemann	Edward Jefferson Halford	Frank H. McKevitt
George Edward Brannan	Merton Moody Hall	Matsuta Takahashi
William Abbott Colburn, Jr.	Earl Robert Harris	Allan Robert Tambling
Clayson Van Gardiner	James Phillips Maher	Stefan Wassilko

MARQUETTE UNIVERSITY, DEPARTMENT OF DENTISTRY.

The annual commencement exercises of Marquette University, Department of Dentistry, were held in Davidson Theater, Milwaukee, Wis., May 23, 1910.

An address was delivered by Rev. Thomas E. Barr.

The degree of Doctor of Dental Surgery was conferred by President McCabe on the following graduates:

H. R. Andrew	W. E. Dana	C. M. Koch	P. F. Quinn	A. M. Schmidler
F. R. Bresee	R. H. Eiche	F. M. Kyburg	M. Reiss	R. E. Smith
J. R. Brown	B. W. Hayes	H. L. Lamphere	O. A. Reschke	W. Tarnutzer
C. A. Cobb	J. L. Herman	A. C. Luecker	L. C. Runde	E. Young
C. S. Cohen	R. S. Hopkinson	J. A. Nelson		

WESTERN DENTAL COLLEGE.

The annual commencement exercises of Western Dental College were held in the Central High School Auditorium, Kansas City, Mo., Saturday, May 14, 1910.

The annual address was delivered by Dr. Burris A. Jenkins.

The degree of Doctor of Dental Surgery was conferred by the dean, D. J. McMillen, M.D., D.D.S., on the following graduates:

J. B. Amphlett	Lloyd H. Frink	S. B. Mills	J. A. Simmons
B. H. Bailey	Joseph H. Harper	W. C. Michell	Sydney W. Simpson
George M. Barrell	T. C. Harper	Amos Mortensen	Everett E. Sims
C. A. D. Beer	J. Otis Haworth	R. W. Pottorf	Tullie W. Sorrels
Edgar L. Blankenship	G. R. Hodge	Walter H. Ragan	Ray Stone
G. L. Bowlby	J. A. Howell	Gordon L. Ross	T. W. Storer
Kelley D. Crockett	S. L. Hull	Ben A. Salzberg	Louise M. Thiessen
Ralph H. Cully	L. P. Larson	Jno. B. Savell	Thos. Orr Thornton
Fairy Maude Dailey	F. L. Leary	G. H. Schaefer	B. C. Turner
Eugene E. Ebling	Clarence A. W. McNutt	A. F. Sebert	S. R. Turner
W. B. Ford	D. A. Meredith		

BARNES DENTAL COLLEGE.

THE annual commencement exercises of Barnes Dental College were held in St. Louis, Mo., May 21, 1910.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Benjamin T. Browning
Frederick W. Cancer
Elver E. Gauley
Vincent A. Grimaud
James H. Patterson
Rollin D. Snerly

COLORADO COLLEGE OF DENTAL SURGERY.

THE annual commencement exercises of Colorado College of Dental Surgery were held in Trinity M. E. Church, Denver, Colo., May 26, 1910.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Leslie Carleton Anderson
Robert William Conger
Jesse Lawrence Daley
Grover Cleveland Freese
Max Giesecke
Newell Allen Gossett
Omar Clyde Hickman
William Henderson Hinkle
Guy Harry Jones
Arthur Leslie King
John Marquardt
James Harold McCrery
Walter Eugene Miller
Joseph Otoupalik
Walter Christian Schaefer
James Harvey Seymour
William Archer Squires
Claude Wesley Thomas
John William Whitehead, B.S.
Ralph Rudolph Willey

UNIVERSITY OF CALIFORNIA, COLLEGE OF DENTISTRY.

THE annual commencement exercises of the University of California College of Dentistry, were held in Berkeley, Cal.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Claude A. Angonnet ..... California
Arthur J. Belton ..... California
Edmund H. Brassel ..... California
Chas. J. Broad ..... California
Edgar R. Campbell ..... California
Louis B. Constine ..... California
James C. Dean ..... California
Raymond F. Gehan ..... California
Arch R. Guthrie ..... California
Masuichi Higaki ..... California
Otto J. Keating ..... California
John W. Leggett ..... California
Robert McL. Leggett ..... California
Mortimer A. London ..... California
Cale C. McQuaid ..... California
Saxon B. Scott ..... California

UNIVERSITY COLLEGE OF MEDICINE, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of University College of Medicine were held in Richmond, Va.

Addresses were delivered by Stuart McGuire, M.D., J. Allison Hodges, M.D., and Major J. C. Hemphill.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Benjamin L. Brooks ..... Virginia
Percy B. Cone ..... North Carolina
Conley E. Greear ..... Virginia
J. Willie Humphreys ..... Virginia
Paul E. Jones ..... North Carolina
Wm. C. Jones ..... Virginia
DeMolay Scribner ..... Virginia
Robert M. Spencer ..... Virginia
Wm. W. Spratley ..... Virginia
George W. Sutherland ..... Virginia
M. Powell Tynes ..... Virginia

ATLANTA DENTAL COLLEGE.

THE annual commencement exercises of Atlanta Dental College were held May 7, 1910, in the Grand Opera House, Atlanta, Ga.

The valedictorian was J. L. Cooper.

The degree of Doctor of Dental Surgery was conferred by Judge W. R. Hammond on the following graduates:

Otis Clarence Arrington
Basil S. Allen
David T. Allison
Cleaveland Demoit Brown
Ira Blake
Clarence J. Black
Joseph Lonnie Bracewell
William B. Blackshear
James Leonard Cooper
Felix D. Cooper
Walter B. Corley
William Henry Chace
Walter Edward Clark
George Henry Dunlap
Sydney Dew Dudley
George Jones Evans
John Clopton Farthing
Aubrey B. Gardner
William B. Goodwin
George Washington Gray
Floyd G. Gower
John Percy Getzen
Earl S. Hightower
Charles Philip Hodge
Robert Lee Hunt
Russell Edmond Ingold
J. Elzey Jones
Ralph W. Johnson
David Durham King
Julian C. Lane
Victor Holmes Lipscomb
John Kindred Molpus
Ernest Asbury Morris
H. McKinnon McDiarmid
Paul H. McDonald
Walter Frank McGill
Joseph Bethune Nix
J. Frank Neville
John Henry Osborne
Hansford M. O'Quinn
Abraham Elias O'Quinn
George H. Peebles
Walter W. Platt
Dwight L. Smith
Eugene E. Stuck
Prescott Bush Spigner, Jr.
Thomas Lafayette Timmerman
Grover Cleveland Vickers
Loyd Earl Wingo
Eugene H. Yearty
William D. Young

UNIVERSITY OF MARYLAND, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of the University of Maryland were held in the Academy of Music, Baltimore, Md.

Addresses were delivered by Hon. Henry F. B. Macfarland and Bernard Carter, LL.D., provost of the university.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Albert J. Allaire	Massachusetts
Frank Robinson Anders	North Carolina
Charles Douglass Ansley	Massachusetts
Nathan E. Austin	New York
Charles De Lacy Bass	North Carolina
Harry Wallace Blaisdell	New Hampshire
Thomas Lawrence Boyle	New York
Herbert Nathan Brown	Rhode Island
Wallace Burgess Bruce	Maryland
Hugh McK. Burns	Connecticut
Sherley Mingo Callaway	West Virginia
Walter Woods Campbell	Massachusetts
Angelus De Conti	Rhode Island
Arthur Davenport	North Carolina
Richard Warland Davis	Georgia
Andres L. Costa Diaz	Porto Rico
Charles Francis Doud	New York
George C. Downey	Massachusetts
George Clarence Dreher	New Jersey
Roy Jerome Drummond	South Carolina
Davis Groff Everhart	Maryland
Abelardo de Azevedo Falcao	Brazil
Hatney A. Infante Fajardo	Cuba
Henry Holton Flowers	Maryland
Frank Henry Flynn	Maine
Wilbert Diedrich Gieseler	West Virginia
Walton J. Graft	New Jersey
Clarence T. Hamrick	North Carolina
Albert Ackley Harrington	New York
Carl C. Harper	North Carolina
William Lawrence Keller	Maryland
Phares L. Landis	Pennsylvania
John Denis Leahy	New Hampshire
James Hugh McGinn	South Carolina
Winston C. McKey	Georgia
Samuel M. Neistadt	Massachusetts
Daniel Eugene Van Nostrand	New Jersey
Harold E. Reginald Pascoe	Australia
Paul Lamar Pearson	North Carolina
Hector L. Peloquin	Massachusetts
Conrad Frederick Reiman	Connecticut
David S. Robinson	New York
Samuel A. Rosen	Maryland
Charles Augustus Ross	Pennsylvania
Jacob L. Solomon	New York
Lena C. S. Sparck	Virginia
Suel Vernon Strickler	Virginia
Benjamin M. Thoman	Maryland
James H. Tippett	New York
Grover Cleveland Trumbo	West Virginia
Ralph Edmund Tryon	New York
Charles Edward Waters	Maryland
Thomas Daugherty Webb	North Carolina
William Pope Wilson	North Carolina

ST. LOUIS DENTAL COLLEGE.

THE annual commencement exercises of St. Louis Dental College were held May 31, 1910, in St. Louis, Mo.

The commencement address was delivered by James J. Walsh, M.D., Ph.D., LL.D.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

C. J. Ball	Missouri
L. J. Bernal	Missouri
W. B. Fletcher	Texas
E. Granger	Missouri
G. B. Greer	Arkansas
A. R. Herman	Illinois
R. G. Heublein	Missouri
E. M. Hodge	Missouri
L. C. Holt	Missouri
S. G. Jones	Arkansas
K. I. Kobbervig	Washington
W. L. Marlow	Missouri
F. W. Miller	Missouri
L. L. Moore	Missouri
F. C. Niemiller	Illinois
A. J. Padberg	Missouri
E. H. Parrish	Kansas
A. Romansky	Missouri
W. O. Schowengerdt	Missouri
A. E. Smith	Kansas
W. B. Taylor	Missouri
A. Von Nahmen	Missouri
P. J. Weckerly	Missouri
W. H. Wells	Missouri
A. C. Whitley	Missouri

CHICAGO COLLEGE OF DENTAL SURGERY.

THE twenty-eighth annual commencement exercises of Chicago College of Dental Surgery were held in the Garrick Theater, Chicago, Ill., May 31, 1910.

Addresses were delivered by the Hon. P. H. O'Donnell and Dr. W. L. Copeland.

The degree of Doctor of Dental Surgery was conferred by Truman W. Brophy, M.D., D.D.S., LL.D., on the following graduates:

Polk E. Akers
Arthur W. Alcombrack
Thomas W. Anderson
Frederick T. Armstrong
Arthur M. Bean
Oliver C. Borah
Charles H. Bramwell
Harold R. H. Brevig
Archie M. Brockway
George F. Buckley
Ralph D. Carpenter
Charles W. Close
Johan G. DeBoer
Joannis N. Demetracopoulos
John L. Devney
Harry P. Farwell
Glenn M. Foster
Harry C. Gill
Edward A. Greenwald
Arnold W. Haarlow
Charles Hainz
Harry E. Hanson
George W. Harker
Emory D. Herring
John C. Higgason
H. R. Hopkins
Irwin G. Jirka
Jonathan I. Jordon
Dodd H. Kanouse
Charles W. Kent
John A. Kimball
Jacob H. Kolter
Ivar T. Krohn
Martin E. Leininger
John S. Lommen
Bernard McKenty
Arthur V. McGregor
George F. McGregor
Harry A. Marx
Le Roy C. Miller
Gustave M. Monick
William C. Murray
Gerson Nachmias
G. A. Nelson
Edward G. Nertney
Ernest C. Newman
Charles M. Pike
George A. Plaas
Charles E. Pollard
Herbert G. Price
Johan C. Prins
Herman A. Proehl
Andre C. Robine
Frank E. Roe
Preston D. Savill
George E. Scarborough
Albrecht E. Schoenwetter
Henry R. Seal
Samuel E. Slotkovitz
George E. Sievers
William H. Smith, Jr.
Parley F. Smith
James O. Smith
Guy M. Smith
Francis A. Soeder
Harry L. Spinney
Charles V. Swartout
Frank K. Switzer
C. Clarence Thayer
T. Thorkeldsen
Paul M. Tofte
Osmund Vinje
Jesse C. Waites
William H. Wall
Herbert G. West
Arthur D. Whittaker
Clifford W. Whitley
William E. Williams
Clarence A. Wollrab
Dana L. Woodworth
Thomas H. Young
Jacob S. Zipperman

HOWARD UNIVERSITY, DENTAL DEPARTMENT.

THE annual commencement exercises of Howard University were held in Washington, D. C., May 25, 1910.

An address was delivered by the Hon. Wm. T. Vernon.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

James B. Brown
Joseph B. Cherry
Conard F. Clarke
Carey V. Freeman
Wm. D. Giles
Wm. D. Godfrey
Gene B. Goggins
Adolph L. Hymans
Andrew L. Jackson
John T. Lattimore
Isaac M. Lawrence
George F. Lumsden
Moses A. Morrison
Egerton L. H. Rance
Edward W. Smith
Park Tancil
Anthony V. Washington
Linford R. Willis

LINCOLN DENTAL COLLEGE.

THE tenth annual commencement exercises of Lincoln Dental College were held in University Temple, Lincoln, Neb., May 26, 1910.

The doctorate address was delivered by Rev. D. R. Leland.

The degree of Doctor of Dental Surgery was conferred by Dr. Clyde Davis on the following graduates:

William Joseph Campion
Edward Xavier Crowley
Calvin Homer Hartwig
George Linus Hewit
Clair LeCount Hill
Clyde Allen McMaster
Roy Logan Minnick
William Cooke Richards
Chas. Lewis Riley
David Watkins Sumner
Thomas Andrew Trumble
Elmer Manning Whinnery
James Edgar Wilson
Walter Henry Wild

UNIVERSITY OF BUFFALO, DEPARTMENT OF DENTISTRY.

THE eighteenth annual commencement exercises of the University of Buffalo, Department of Dentistry, were held in the Teck Theater, Buffalo, N. Y., May 27, 1910.

An address was delivered by Matthew D. Mann, A.M., M.D.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Howard Walrath Allen
E. Roy Alling
DeWitt Talmage Bell
James Lanckton Clements, Jr.
John Francis Collins
Arthur J. Cramer
Eugene Joseph Fraine
Edward George Froeber
John Lyall Garretson
Frederick Joseph Hall
LeRoy E. Herbig
Eola Marguerite Miller
Albert Kendrick Osgood
Mira Hagaman Pike
Charles Francis Redner
Lee Adam Roth
Floyd Fenton Thompson

NORTH PACIFIC DENTAL COLLEGE.

THE annual commencement exercises of North Pacific Dental College were held May 23, 1910, in the First Baptist Church, Portland, Ore.

The annual address was delivered by Dr. W. T. Williamson, and the valedictorian was Rives Millette Emerson, D.M.D.

The degree of Doctor of Dental Medicine was conferred by Dr. J. Francis Drake on the following graduates:

Clarence Ehrenberg Bollermann
Henry Roux Clark
Nanette Finley Clay
Rives Millette Emerson
Daniel Willan Giles
Arthur Wilmer Greenius
Arthur Blaine Howell
Clarence Vedder Luther
Francis Patrick McGreal
Elmer Eugene Mose
Carl Blaine Ogle
Ensi Emil Pajunen
Charles Hodge Pollock
Benjamin Franklin Pound
Charles Erwin Randle
Louis Albert Rudow
Albert Parker Ryan
Edmund Scofield
William Edgar Smith
Milton Adams Stratton
Frederick Edwin Witham

COLLEGE OF DENTAL AND ORAL SURGERY OF NEW YORK.

The annual commencement exercises of the College of Dental and Oral Surgery of New York were held on Monday, May 30, 1910, in Mendelssohn Hall, New York, N. Y.

An address to the graduating class was delivered by Rev. Chas. Townsend, D.D.

The degree of Doctor of Dental Surgery was conferred by Mr. Clarkson Cowl, president of the board of trustees, on the following graduates:

Leah Abramskaia
Benjamin Brahms
Abraham Brown
David R. Christie
Chas. M. Cole
Abraham Gilman
Wm. Goldman
Arnold T. Goldwater
Sophie Gortz
Leon Greenfield
Henry H. Harrison
John W. Held
Frederick K. Husfeld
Ralph Kipp
Fanny Kleiner
Cemach Kopelsohn
Bertha F. Kreis
Isidor J. Kurz
Beatrice H. Kutyn
Theodora Kutyn
Zesel Lichtenstein
Wm. H. McDonald
Kannon Sheinman
John J. Sloman
Nathan B. Stang
Max B. Steiner
Julius L. Tell
Meyer Weiss
Solon Weissman

GEORGETOWN UNIVERSITY, DENTAL DEPARTMENT.

The annual commencement exercises of Georgetown University, Dental Department, were held in Gaston Hall, Washington, D. C., on June 11, 1910.

The valedictorian was Francis J. Rogers, and an address to the graduates was delivered by Prof. John D. Hird, A.M., LL.M.

The degree of Doctor of Dental Surgery was conferred by Rev. Joseph Himmel, S. J., on the following graduates:

Stanley E. Armstrong ..New York
Geo. H. Becker .....District of Columbia
Frederick Cary .....New York
Walton C. Carroll .....Maryland
Wm. M. Fanning .....Rhode Island
Wm. A. Harrison, Jr. ..Connecticut
Waldo R. Pearce .....District of Columbia
Chas. R. Pelton .....Michigan
Casimir E. Perrier .....Rhode Island
Francis J. Rogers .....Massachusetts
Wm. B. Seward .....Ohio
Leo W. Solbach .....Maryland

MEDICO-CHIRURGICAL COLLEGE, DENTAL DEPARTMENT.

The annual commencement exercises of the Medico-Chirurgical College, Dental Department, were held in the Academy of Music, Philadelphia, Pa., on Friday, June 3, 1910.

An address was delivered by Congressman David J. Foster of Vermont.

The degree of Doctor of Dental Surgery was conferred by the president, Henry F. Walton, on the following graduates:

Harry Blitzstein
Edward Joseph Bradley, Jr.
Anatole Bronstein
Thomas William Bunting
Isaac W. Cohen
Henry Charles Croker
Anthony Joseph Dean
Frederick Joseph Dillon
Morris Duitch
Abraham Feinstein
Joseph H. Feldman
Joseph Francis Folz
William Francis Frediana
Jose R. Gallego Del
Martin K. Glassman
Joseph Arthur Goldberg
Jacob Goldberg
Morris Goldberg
Harry Albert Hallen
Joseph Abraham Hechtmann
William Arthur Hopkins
Rutledge M. Howard
Robert Garfield Johns
Bernard Kessler
Abraham Kuntz
Walter Straford Kutz
Edward Isaac Lacker
Daniel E. Martinez
Nathaniel Abraham Maser
Eugene Vincent McAvoy
Echlin Johnson Mitchell
Robert Mansfield Newhard, Jr.
Thomas B. O'Donnell
Nathaniel Aaron Olinger
Isaac Orscher
Charles D. Renard
Henry Relkin
Samuel Philip Ritter
Charles Robaszkiewicz
Elias Ross
Jose Gregorio Seravia
Leon Schneyer
Oliver Jacob Scheetz
Harry N. Shor
Leonard Watson Stagg
Jasques Strulovich
Louis Slutzky
Otto Treitman
Emilio H. Velutini, Jr.

PHILADELPHIA DENTAL COLLEGE (TEMPLE UNIVERSITY).

The annual commencement exercises of Philadelphia Dental College (Temple University), were held in the American Academy of Music, Philadelphia, Pa., June 4, 1910.

The commencement address was delivered by Rev. Newell Dwight Hillis, D.D.

The degree of Doctor of Dental Surgery was conferred by the vice-president, Elmer E. Brown, M.D., on the following graduates:

Robert L. Allen	Connecticut
Wm. R. Alexander	Missouri
Elmont Bedell	New York
Harry A. Burnes	Connecticut
Walker J. Burns	New York
James F. Carmody	Connecticut
Wm. H. Chinneck	Canada
Sylvester T. Cohane	Connecticut
Wm. J. Cotter	Massachusetts
John Wm. Eaton	Pennsylvania
Edward H. Griffiths	British Columbia
Linnell T. Hewes	Maine
Earl Houghton	Connecticut
Francis S. Keating	Massachusetts
Reinard S. Keeler	Pennsylvania
Dennis J. Killeen	Massachusetts
Samuel Loveman	New Jersey
Edward S. Maloy	Pennsylvania
David A. Mulford	New Jersey
Basil O'Grady	Maine
Diana Pergament	Russia
Paul Rohrer	Pennsylvania
Francisco L. Rodriguez	Cuba
Elena C. de Ros	Greece
Horace Tantum	New Jersey
Harold Van Blarcum	New York
Henry G. West	Connecticut
Irving N. Wood	Vermont

NEW YORK COLLEGE OF DENTISTRY.

The annual commencement exercises of New York College of Dentistry were held June 6, 1910, in Carnegie Hall, New York city.

An address to the graduates was delivered by Rev. Frederick W. Norris, D.D.

The degree of Doctor of Dental Surgery was conferred by Rev. Geo. Alexander, D.D., on the following graduates:

Marcus Arginteanu	New York
Diran Puzant Bender	New York
Julius Edward Berger	New York
Charles Albert Bushong	New York
Edward Andrew Cain	New York
Maurice Samuel Calman	New York
Henry Jehuda Cooper	New York
Paul David	New York
Robert Edward Elster	New York
William Simon Engelberg	New York
David Engelman	New Jersey
George Washington Fischer	New York
Maurice Emanuel Freiman	New York
Solomon Gettenberg	New York
Max Gluck	New York
Harry Goldberg	New York
Morris Morris Goldberger	New York
Bernard Francis Goldstein	New York
Harry Abraham Gordon	New Jersey
Morris Gottlieb	New York
Benjamin Graboff	New York
Harry Irwin Greif	New York
Philip Grubin	New York
Edward Albert Heinzer	New York
Walter Abraham Hoffman	New York
Harris Holster	New York
Gustaf Bartel Johnson	New York
Henry Benjamin Kahn	New York
Emanuel Manuel Kaplan	New York
Jerome Valentine Kaufmann	New York
Samuel Lang	New York
William Edmund Lawrence	New York
Samuel Theodore Levitas	New York
Benjamin Lottman	New York
Joseph Mann	New York
Frederick Paul Nief	New Jersey
Bissell Barbour Palmer, Jr.	New York
Norman Augustus Post, Jr.	New York
Solomon Philip Ratner	New York
Frank John Remy	New York
Lewis Rice	New York
Harry James Roberts	New Jersey
David Daniel Salisch	New York
Morris Sanft	New York
Henry George Scholz	New York
David Schorr	New York
Albert Louis Schreiner	New York
Bernard Schumer	New York
Walter Scott	New York
Jacob Robert Shapero	New York
James Skidmore Shields	New York
Isadore Jerome Silverman	New York
Joel Lawrence Skidmore	New York
Arthur Somkin	New York
George Andrews Talbot	New Jersey
Avram Tudic	New York
Pelham Newcomb Vanderbeek	New Jersey
Julius Milton Weinberger	New York
Tobias Zauderer	New York

McGILL UNIVERSITY, DENTAL DEPARTMENT.

THE annual commencement exercises of McGill University, Dental Department, were held June 9, 1910, in Montreal, Canada.

The valedictory was delivered by Dr. Thomas A. Robinson, and an address to the graduates was given by Prof. T. Wesley Mills, M.A., M.D., F.R.C.S.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Edward P. Hawkshaw
Donald S. H. McDonell

WASHINGTON UNIVERSITY DENTAL SCHOOL.

THE forty-ninth annual commencement exercises of Washington University Dental School were held on Thursday, June 9, 1910, in St. Louis, Mo.

Addresses were delivered by Rev. Geo. H. Combs, D.D., and Wm. H. Welch, M.D., LL.D.

The degree of Doctor of Dental Surgery was conferred by Chancellor David F. Houston, LL.D., on the following graduates:

Alphonse A. Arnold
Clarence W. Baird
Robert E. Beattie
Dorian J. Bentley
Albert F. Bolm
Fred W. Brownfield
Sam A. J. Carroll
Everett C. Craig
John E. Elder
John M. Elder
Leonard J. Huber
Gustavus J. Krotzsch
Wilhfur D. Poindexter
Edwin B. Probasco
Gilbert C. Rees
Emil F. Rust
John W. Schroers
Ralph A. Sherrard
Louis P. Thomas
John C. Triska
Frederick W. Troester
Sophie M. Wachsmuth
Julius A. Walther
Clarence F. Wettstein
Virgil R. Wheeler
Harry C. Wright

STATE UNIVERSITY OF IOWA, COLLEGE OF DENTISTRY.

THE twenty-eighth annual commencement exercises of the State University of Iowa, College of Dentistry, were held in Iowa City, Iowa, June 15, 1910.

The commencement address was delivered by Cyrus Northrop, LL.D.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Roland Baxter Allender ..... Missouri
Lyle G. Baker ..... Iowa
Tracy Ezra Barber ..... Iowa
Robert Peter Booher ..... Iowa
Wallace James Booher ..... Iowa
Asa R. Bowie ..... Iowa
Lavender Parks Clow ..... Iowa
Archie Lott Dean ..... Iowa
Ray Alman Denman ..... Kansas
Paul Albert Edmand ..... Iowa
Ernest William Elmen ..... South Dakota
James Marcus Hagerty ..... Iowa
Fletcher Harold Herrald ..... Iowa
Guy Lewis Horton ..... Iowa
Edward Theodore Hupp ..... Iowa
John Henry Kelley ..... Iowa
Ezra White Kerr ..... Iowa
Guy Bark Kinney ..... Iowa
Ernest Thomas Lake ..... Iowa
Francis Michial McGruder ..... Iowa
Alvin Louis Miller ..... Iowa
Charles Lester Nevins ..... Iowa
William Robert Ogle ..... Iowa
Herman Alfred Peterson ..... Iowa
Laurence Victor Peterson ..... Iowa
Charles Arthur Pike ..... South Dakota
Leslie Reid ..... Minnesota
George Laurence Rice ..... Iowa
William Arthur Ruge ..... Iowa
Joseph Franklin Schoen ..... Iowa
Earl Benjamin Smith ..... Iowa
Roy Snakenberg ..... Iowa
Rachel Helen Stahle ..... Iowa
William Marshall Storey ..... Iowa
Fred Ferson Taylor ..... Iowa
Bernard Thiegs ..... Minnesota
Paul Levi Thompson ..... Iowa
Fred Tiesse, Jr. ..... Iowa
Roscoe Delzen Tiffany ..... Iowa
John S. Voreck ..... Iowa
James William Wray ..... Iowa
Chester Carl Zellhœfer ..... Iowa

INDIANA DENTAL COLLEGE.

THE thirty-first annual commencement exercises of Indiana Dental College were held in Indianapolis, Ind., June 8, 1910.

An address was delivered by Richard B. Moore, B.S.

The degree of Doctor of Dental Surgery was conferred by George Edwin Hunt, M.D., D.D.S., on the following graduates:

Roy French Barnard
Frank Wells Bethell
Walter M. Broughton
Harrison L. Burris
Charles H. Carpenter
Thomas H. Casey
A. Beecher Claypool
Charles P. Conklin
John Edward Davidson
Ralph C. Day
Joseph M. Doyle
John W. Fulenwider
I. Lester Furnas
Ralph A. Gephart
Delbert J. Harris
Arthur C. Harvey
George Walter Havens
Charles J. Hawkins
Wilber R. Hooper
William W. Ketcham
Raymond King
Archie Leroy Latimer
Elsie E. Laymon
Frank B. McAdams
James J. McCloskey
Edgar A. P. McMullen
Roy T. Marshall
Eldo O. Metzger
Lee A. Musser
Lee Louis Organ
Frank L. Owens
George W. Perlee
Monta C. Phillips
Louis G. Poehls
Jesse Rhodes
Arthur John Rochford
Jesse L. Rohm
Cashius DeArmond Ross
Gordon T. Runcie
Isidor Seidel
J. Frank Shaddock
Scott W. Shields
Alexander F. Stamm
Warren L. Stamper, M.D.
William Weir Stuart
Warren G. Torrence
Clyde W. Weaver
Rollin F. Wilcox
Garland L. Young

UNIVERSITY OF MINNESOTA, COLLEGE OF DENTISTRY.

THE annual commencement exercises of the University of Minnesota, College of Dentistry, were held in the Armory, Minneapolis, Minn., on June 9, 1910.

An address was delivered by President Cyrus Northrop, LL.D.

The degree of Doctor of Dental Surgery was conferred by the president on the following graduates:

Frank W. Adams	Minnesota
Roscoe C. Bellingham	Washington
Chas. P. Brady	Minnesota
Peter J. Brekhus	Minnesota
Leroy M. Chapman	Minnesota
Leo P. Commers	Minnesota
Wm. J. Crydermann	North Dakota
Francis W. Dunbar	Minnesota
Joseph W. Dvorak	Minnesota
Hal S. Goldblum	Minnesota
Alfred W. Grandy	Minnesota
Jack N. Greenberg	North Dakota
Wm. C. Hanson	Minnesota
Grant T. Hart	Minnesota
Oscar W. Hauck	Minnesota
Robert C. D. Higgins	Ohio
Earl L. Hughes	North Dakota
Howard G. Ingersoll	Minnesota
Francis R. Keller	Minnesota
Fred O. Krejci	Minnesota
Henry F. Lange	Minnesota
Arthur P. Little	Minnesota
John A. Maker	Minnesota
James W. Maland	Minnesota
Ewing C. McBeath	Washington
Arthur E. Mittver	Minnesota
Dennis J. Murphy	Minnesota
Harry W. Nelson	Minnesota
Ray H. Nelson	North Dakota
Clarence E. Oberg	Minnesota
Mark O. Pattridge	Minnesota
Carl H. Petri	Minnesota
Geo. W. Reynolds	Minnesota
Wm. F. Rounds	Minnesota
Harvey C. Samuels	Minnesota
Benjamin H. Saunders	Minnesota
Louis W. Scott	Minnesota
Geo. A. Sheils	Minnesota
Edward E. Smetana	Minnesota
Chris B. Solberg	Minnesota
Wilton B. Stone	Minnesota
Erwin E. Thomson	Minnesota
Harry A. Wells	Minnesota
Harry C. Whitney	South Dakota

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS:

July and August.

JULY.

National Meetings at Denver.

National Dental Association. Denver, Colo. Four days: July 19th to 22d.

National Association of Dental Examiners. Denver, Colo, July 25th.

National Association of Dental Faculties. Denver, Colo. July 25th.

Dental Faculties Association of American Universities. Denver, Colo. July 18th.

Delta Sigma Delta Fraternity. Denver, Colo. July 18th.

Psi Omega Dental Fraternity. Denver, Colo. July 18th.

New Mexico Dental Society. Las Vegas. Three days: July 16th to 18th.

New Jersey State Dental Society. Asbury Park. Four days: July 20th to 23d.

North Carolina Dental Society. Wrightsville. Four days: July 13th to 16th.

Wisconsin State Dental Society. Ashland. Four days: July 12th to 15th.

AUGUST.

Virginia State Dental Association. Staunton. Three days: August 3d to 5th.

Examiners' Meetings.

Hawaii Board of Examiners. Honolulu. July 30th.

Maine Board of Examiners. Portland. July 5th.

Montana Board of Examiners. Helena. July 11th to 13th.

New Jersey Board of Registration. Trenton. July 5th to 7th.

North Carolina Board of Examiners. Wrightsville. July 11th.

South Dakota Board of Examiners. Sioux Falls. July 6th to 8th.

Vermont Board of Examiners. Montpelier. July 5th to 7th.

Wyoming Board of Examiners. Cheyenne. July 5th to 7th.

DENTAL INDEX BUREAU

UNDER THE AUSPICES OF THE

NATIONAL ASSOCIATION OF DENTAL PEDAGOGICS.

The following matter has been issued in the form of a circular justly purporting to be "of special interest to students, writers, publishers, editors, librarians, colleges, dental societies, etc." It is described as—

A Plan by which Subscribers will be Furnished a Classified Card Index of Articles in the Leading Dental Journals.

At a meeting of the National Institute of Dental Pedagogics, held in St. Louis last December, a committee was appointed to establish a Dental Index Bureau. Briefly stated, it is intended that this committee shall employ a competent person to review and classify all of the articles in ten or twelve of our leading dental journals, and shall furnish to each of the subscribers to the Bureau, at frequent intervals, cards so classified and grouped that the subscriber may easily and quickly find all the articles on any subject in dentistry. These cards will be made on definite system, by which additional cards may be added as they are received and always go to their proper places; so that no matter how many additions may be made from year to year, all of the cards on each subject will be in a separate group. For example, all of the articles on the subject of filling teeth with gold will be in one group, all on filling teeth with amalgam in another, all on cavity preparation in another, all on alveolar abscess in another, etc.

It is hardly necessary to mention the value of such an index to the wide-awake members of the profession. Journals which may have accumulated, and which are now almost worthless on account of the difficulty in finding articles when desired, will become of serv-

ice as the index is extended to cover them. The man who has occasion to look up a particular subject, or to write a paper, can find all that has been written on that subject instantly. The grouping of articles on each subject enables one to bring together the views of many writers. Post-graduate courses of study can be instituted by dental societies or undertaken by individuals; the ready reference index will make college libraries of the greatest value to the faculty and to the student body; editors and writers will find their work facilitated, and the results of their study more gratifying to themselves and more highly appreciated by their readers.

The idea of the committee is to organize a permanent society for the purpose of classifying and indexing all dental literature. The present plan is but preliminary to the greater work, which will cost less and less to individual subscribers as the number of members is increased. Those who help to start the work will profit more than those who follow, and will have the satisfaction of participating in one of the greatest advance movements in dentistry.

The subject-matter of several of the leading dental journals has already been classified and indexed by Dr. Arthur D. Black, at a great expenditure of time and money. This index contains about 40,000 cards, cataloging articles in various journals from 1839 to date; but it is not available, for obvious reasons, to the profession at large. Your committee is privileged to copy these cards, should the funds subscribed permit, which would be of great benefit to the subscribers and incidentally to the whole profession.

It is the committee's intention to this year furnish each subscriber with author and subject cards for all original articles, papers read before societies, book reviews, and editorials, in about ten journals for 1908 and 1909—from 4000 to 5000 cards, all properly arranged with all cards for each subject together, with guide cards for each subject and with author cards arranged alphabetically. It is expected that in 1910 the cards will be furnished for the same journals for the years 1907 and 1910; and in 1911 cards for 1906 and 1911. Thus in three years each subscriber will receive cards for these journals for six years—probably 25,000 to 30,000 cards. These cards will be sent in boxes in which they may be kept permanently. The number of journals indexed and the number of cards sent out by the committee, however, will depend upon the number of subscribers.

The preliminary report of this committee, which was made at the St. Louis meeting, gives an outline of the plan. It will be noticed that it is the intention to try this plan for a period of three years, and subscriptions at the rate of Twenty-five Dollars ($25.00) a year for that period may be sent to any member of the committee.

Subscriptions will be received from individuals, dental journals, dental schools, or dental societies. Any person or group of persons may send in a single subscription, and one set of cards will be sent in return. Subscription blanks may be had from any member of the committee.

Committee for 1910—Dr. W. L. Fickles, *Chairman*, 6200 Penn ave., Pittsburg, Pa.; Dr. Arthur D. Black, 31 Washington st., Chicago, Ill.; Dr. Herman Prinz, 603 Century Bldg., St. Louis, Mo.

Report of the Committee on Classifying and Indexing Dental Literature, to the Institute of Dental Pedagogics, at the annual meeting, St. Louis, 1908-1909.

The undersigned committee, appointed by the Institute of Dental Pedagogics for the purpose of devising ways and means for classifying and indexing current dental literature, as an evidence of progress presents to the members of the Institute and others interested the following plan:

1. That the subscribers to this plan organize themselves into an association to be known as The Dental Index Bur au.

2. That the above-mentioned committee, appointed by the Institute, will devise ways and means for carrying out the work of the Bureau during the coming year, and will call a meeting at the time and place of the next meeting of the Institute, for the perfecting of a permanent organization.

3. That this committee will employ a competent person to classify as much of the current dental literature as possible, beginning with January 1909 journals, and will furnish subscribers, at frequent intervals, with author and subject cards of all articles classified.

4. That this committee will be guided by a vote of the subscribers in the selection of the literature to be classified.

5. If the funds subscribed will permit, as much as possible of the literature of previous years will be similarly classified and indexed.

W. L. Fickes, *Chairman*,
Arthur D. Black,
Herman Prinz.

The Meetings at Denver.

COMMUNICATION FROM THE PUBLICITY COMMITTEE, N. D. A.

THE National Dental Association, the National Association of Dental Examiners, the National Association of Dental Faculties, the American Society of Orthodontists, the Dental Faculties Association of American Universities, the Delta Sigma Delta Fraternity, and the Psi Omega Dental Fraternity, all meet at Denver during July.



SILVER LAKE AND THE SNOWY RANGE.
(Published by courtesy of "Switzerland Trail" Route.)

As Denver has without difficulty cared for such conventions as the Knight Templars, Elks, G. A. R., N. E. A., and the National Democratic Convention, the accommodations are more than ample.

The first-class hotels of Denver are so numerous that an attempt to enumerate them in the space allotted to this article is out of the question. Rooms without bath can be secured for from $1.00 to $2.50 per day, and for two persons, from $1.50 to $3.00; with bath $1.50 to $3.00, and for two persons in room, $2.00 to $5.00 per day, according to location and size of room. In and near the center of the city there are many high-class rooming-houses where rooms can be secured at lower rates, while in the many excellent restaurants throughout the business section, meals can be procured at reasonable prices. Board and room can also be had in boarding houses or private families.

A booklet on Denver, containing a list of all the hotels with their rates, together with much other valuable information, will be mailed upon request to the Publicity Committee. To secure the best accommodations, reservations should be made in advance.

From the 15th of June, the committee will have a competent and experienced man, familiar with the city and state, devote his entire time to arranging for the accommodation of all guests in accordance with their wishes. This plan has been adopted to insure prompt and undivided attention to all of the many matters which are of vital importance to the comfort of the visitors.

Special plans will be made to entertain the wives and families of the visiting dentists during the sessions of the convention.

The Brown Palace Hotel will be hotel headquarters for the National Dental Association, the American Society of Orthodontists, and

the Psi Omega Dental Fraternity; the Savoy Hotel will be the headquarters for the National Dental Association, the National Association of Dental Examiners and the Delta Sigma Delta Fraternity, and the Shirley Hotel will be the headquarters for the National Association of Dental Faculties. These hotels are all located at the intersection of Seventeenth st. and Broadway. Street-cars connect them with the Union Depot, which is at the foot of Seventeenth st.

Reservations for accommodations at the Brown Palace Hotel, the headquarters for the National Dental Association, should be made in advance through the Publicity Committee.

W. A. Ivory.
W. V-B. Ames Co.
Apothecaries Co.
James J. Ottinger.
Lambert Pharmacal Co.
Denver Chemical Co.
Pelton & Crane.
Lee Smith & Son Co.
Dental Protective Supply Co.
Mulford & Co.
Columbus Dental Mfg. Co.
Pinches Dental Mfg. Co.
DeVilbiss Mfg. Co.
Ransom & Randolph.
American Cabinet Co.
L. D. Mosher.
Electro Dental Mfg. Co.

All indications are that the meeting will be a large and interesting one, with a good attendance from all parts of the country. As this will be the first meeting of the National west of the Mississippi river, many will want to attend for the sake of the meeting and the opportunity to see some of the many attractions for which the state of Colorado and the city of Denver are noted.



ENTRANCE TO BOULDER CAÑON.
(Published by courtesy of "Switzerland Trail" Route.)

The entire business of the National Dental Association will be conducted under one roof —the Auditorium—one of the largest convention halls in America. This building, owned and managed by the city, is absolutely fireproof, and is so designed that part of it can be used as a theater, seating about 4000 people, leaving ample committee rooms and abundant space for clinics and exhibits. All of these features can be operated without interference with each other.

The following firms will exhibit:

S. S. White Dental Mfg. Co.
Harvard Co.
A. C. Clark Co.
Dentists' Supply Co.
Eli Lilly & Co.
Horlick's Malted Milk Co.
Kolynos Co.
Chas. H. Phillips Chemical Co.
Ritter Dental Mfg. Co.

Colorado is called the "Switzerland of America." President Roosevelt said it is the "Playground of America," and Denver, the gateway to this wonderful scenery, is justly known as the "Queen City of the Plains." Situated fourteen miles from the foothills, it commands a view of over two hundred and fifty miles of mountains, while the breezes from these snow-capped peaks, together with its altitude of one mile above sea level, provide a climate at once restful and exhilarating.

All who come to Denver, if they would see

the real beauties of Colorado's mountains, should avail themselves of some of the innumerable opportunities for outings.

Summer excursion rates prevail from all parts of the country, and details concerning them can be secured from local ticket agents. The summer excursion rates out of Denver to points of interest in Colorado are very low, being on sale continuously throughout the summer; while much lower rates are in effect for three-day excursions—Saturday, Sunday, and Monday—and lower still for Sunday excursions. Certain other days in the week tickets are on sale to all points in the state at rates much lower than the regular





SCENES IN THE PLATTE CAÑON.

excursion rates, and to the principal resorts in the state, especially low fares are in force for parties of three or more traveling on one ticket. All of these tickets have their special features regarding time limit and stop-over privileges. Accommodations can be secured at the various resorts in the state to suit the tastes of all, at from $7.00 per week and up, with board, and one may choose to rough it or to live at the finest appointed hotels.

There are trips occupying a few hours, a day, or more time; in fact, trips to suit the purse or time of all, each with its special charm, worth seeing, and to be remembered always. To enumerate all in this article is out of the question, but a few examples may be mentioned: The far-famed Georgetown Loop and Mt. McClellan trip, which reaches an altitude of 14,007 feet, is the highest point reached on any regular railroad in the world.

Boulder, where the Colorado Chautauqua is located, is thirty miles from Denver, one hour's ride, or continuing the trip one may take the "Switzerland Trail" route, another of the one-day excursions out of Denver.

Morrison and the Garden of the Titans, which rivals the world-renowned Garden of the Gods at Colorado Springs, is an hour's ride from Denver.

In Platte Cañon, a favorite resort for fishermen, from one to three hours' ride, the railroad follows the cañon of the South Platte river for about fifty miles, where there are many hotels, cottages, and camping-places.

The Moffat Road, in course of construction from Denver to Salt Lake City, is now completed through to Steamboat Springs in the northwest corner of the state. Three hours' ride from Denver it crosses the Continental Divide at an altitude of 11,000 feet. It has opened up an empire hitherto almost untouched by the hand of civilization; a country rich in delights to the lover of nature, the hunter, and the fisherman.

Estes Park has become so famous that it promises to be a rival of the other wonderplaces of the country, such as the Yellowstone National Park and the Yosemite Valley, and is reached in three hours by train and automobile. A movement is now under way to convert this into a National Park.

One may see Colorado Springs, with her beautiful homes and excellent hotels, and Manitou, at the base of Pike's Peak, from where one may ascend the mountain by cog-wheel train or visit the Garden of the Gods and other picturesque places; Cripple Creek and Victor, the gold-mining camps, can be reached in two hours from Colorado Springs over railroads traversing most beautiful

mountains. For longer trips, if one has the time, there is the Midland Road, through Ute Pass, Hellgate, and down the Fryingpan river, famous as a trout stream; or take the Denver & Rio Grande through the Royal Gorge over Tennessee Pass and through the Eagle River Cañon to Glenwood Springs, from which point both roads follow down the Grand River Cañon to Grand Junction, which is the heart of the famous peach and apple district.

The "Trip Around the Circle." Nowhere in the world are there a thousand miles of railroad travel with so much of the beautiful and so many features of interest, scenic and historical, as are to be seen on the "Around the Circle Trip." This passes through Alamosa in the center of the San Luis Valley, through Durango, Silverton, Ouray, and Telluride; through two Indian reservations and the Mesa Verde National Park, set apart by the government to protect the prehistoric "Ruins of the Cliff-dwellers."

Side-trips from this tour can be taken to the Wheeler National Park near Wagon Wheel Gap, on the Rio Grande del Norte, to Pagosa Springs, and to the wonderful natural bridges of southeastern Utah. The Royal Gorge is seen on this trip, and either the Black Cañon of the Gunnison and Marshall Pass, or the Grand River Valley and Glenwood Springs.

It would be out of place to pass without mention of the Hot Mineral Springs of Colorado.

When America shall have made its mark in the pages of classic history, the people of the globe will be making both winter and summer tours across the oceans to the famous watering-places of Colorado, at Glenwood Springs, Pagosa Springs, Sulphur Springs, and Steamboat Springs. Few people realize the size, variety, and medicinal value of these springs, the ease of access to them, the delightful summer and winter climatic conditions, and the excellent accommodations to be had.

It is hoped that all dentists who come will bring their wives and families with them, as the ladies and children will derive quite as much pleasure and benefit from a vacation in Colorado.



MOUNT OF THE HOLY CROSS.

The committee has arranged to devote the day following the adjournment of the National to an entertainment which will be in keeping with the season and environment.

The railroads running into Denver are: The Union Pacific, Burlington, Rock Island, Santa Fé, Missouri Pacific, Denver & Rio Grande, Colorado & Southern, the Colorado Midland, and the Moffat Road.

Special train and car service is being arranged from Chicago and St. Louis. The round trip rate from Chicago is $30.00, from St. Louis, $25.00, and from Kansas City and Omaha, $17.50.

N.B.: It is not generally known that these tickets can be purchased through to Colorado Springs and Pueblo at the same rate as to Denver. By doing this the tourist can visit the numerous points of interest south of Denver (Colorado Springs, Manitou, the Garden of the Gods, Pike's Peak region, Pueblo, etc.), without any additional expense for transpor-

tation. These tickets allow unlimited stop-overs, within final limit, in both directions at Denver and Colorado Springs, giving all the time desired to attend the convention, take in the side trips, etc. Tickets may be validated for return passage at either of the points mentioned, leaving it optional with the purchaser whether the ticket be used south of Denver.

Rates from Texas and the South will be one and one-third fare for round trip.

Many of the rates are not definitely determined yet, but in general they will be based upon a fare and one-third for the round trip. Rates from Ogden, Salt Lake, and Utah common points will be $22.50, and from California points the rate will be $55.00, on sale July 14th and 15th, final return limit three months. There will be cheap excursion rates from Denver to the Pacific Coast.

Local offices will be established at the Union Station, July 17th, 18th, and 19th, to direct and assist arriving visitors, and throughout the entire meeting offices will be maintained at the Brown Palace Hotel and at the Auditorium, at which latter place will be the principal office of the Local Committee, where can be secured all information relating to the meeting, the city and state, the hotels and railroads. There will be provided for distribution literature from all the railroads, and complete information concerning vacations in the mountains. A great deal is being said about opportunities for vacations in the mountains simply because we know that people who avail themselves of such will not be disappointed. This statement is based not upon our own feelings in the matter, but upon the statements of those who spend their summers in Colorado.

Do not fail to bring with you a light overcoat or wrap, and if you are going into the mountains bring warm underwear, strong high shoes, and old clothes.

Immediately upon arrival, visitors are requested to register and give forwarding instructions for mail. In case any change of address is made while in the city, they are requested to notify the committee at once.

Mail addressed "care National Dental Association, Denver, Colo.," will insure prompt delivery.

To avoid confusion, all matters pertaining to hotels, railroads, mail, and addresses of visitors, and information in general will be handled through the Publicity Committee.

For detailed information, vacation suggestions, estimates, etc., write

Dr. H. F. Hoffman,
Ch'man Publicity Committee, N. D. A.
612 California bldg., Denver, Colo.

NATIONAL DENTAL ASSOCIATION MEETING.

Denver, Col., July 19-22, 1910.

Officers.

Burton Lee Thorpe, St. Louis, Mo., *President.*

W. T. Chambers, Denver, Col., *Vice-president—West.*

C. W. Rodgers, Dorchester, Mass., *Vice-president—East.*

T. P. Hinman, Atlanta, Ga., *Vice-president—South.*

H. C. Brown, Columbus, Ohio, *Corresponding Secretary.*

Charles S. Butler, Buffalo, N. Y., *Recording Secretary.*

A. R. Melendy, Knoxville, Tenn., *Treasurer.*

Executive Committee.

J. D. Patterson, *Chairman,* Kansas City, Mo.

First Division—Committee on Arrangements.

J. D. Patterson, Kansas City, Mo.
C. M. Work, Ottumwa, Iowa.
W. G. Mason, Tampa, Fla.

Second Division—Committee on Credentials and Auditing.

V. H. Jackson, New York, N. Y.
H. B. McFadden, Philadelphia, Pa.
M. F. Finley, Washington, D. C.

Third Division—Committee on Voluntary Essays.

L. Meisburger, Buffalo, N. Y.
F. B. Kremer, Minneapolis, Minn.
C. J. Grieves, Baltimore, Md.

Executive Council.

H. J. Burkhart, *Chairman,* Batavia, N. Y.
A. H. Peck, Chicago, Ill.
B. Holly Smith, Baltimore, Md.
W. E. Boardman, Boston, Mass.
C. L. Alexander, Charlotte, N. C.
Burton Lee Thorpe, C. S. Butler (*ex-officio* members).

Pharmacopeial Convention.

M. F. Finley, *Chairman*, Washington, D. C.
A. H. Peck, Chicago, Ill.
Joseph Head, Philadelphia, Pa.

Dental Educational Council.

J. V. Conzett, Dubuque, Iowa.
Richard Summa, St. Louis, Mo.
Louis Meisburger, Buffalo, N. Y.
Howard E. Roberts, Philadelphia, Pa.
A. R. Melendy, Knoxville, Tenn.

Committee on History.

Chas. McManus, *Chairman*, Hartford, Conn.
E. C. Kirk, *Vice-chairman*, Philadelphia, Pa.
Burton Lee Thorpe, *Secretary*, St. Louis, Mo.
H. L. Ambler, Cleveland, Ohio.
James McManus, Hartford, Conn.
Wm. H. Trueman, Philadelphia, Pa.
S. A. Freeman, Buffalo, N. Y.
B. J. Cigrand, Chicago, Ill.
C. J. Grieves, Baltimore, Md.
J. Y. Crawford, Nashville, Tenn.
C. S. Butler, Buffalo, N. Y.
W. E. Boardman, Boston, Mass.
W. R. Wright, Jackson, Miss.

Committee on State and Local Societies.

H. C. Brown, *Chairman*, Columbus, Ohio.
J. W. Hull, *Vice-chairman*, Kansas City, Mo.
A. J. Cottrell, *Secretary*, Knoxville, Tenn.
R. W. Carroll, Beaumont, Tex.
J. C. Watkins, Winston-Salem, N. C.
Victor C. Jones, Bethlehem, Pa.
T. T. Moore, Jr., Columbia, S. C.
H. W. Campbell, Suffolk, Va.
C. V. Watts, Des Moines, Ia.
O. H. Simpson, Dodge, Kans.
Max Eble, Louisville, Ky.
J. D. Eby, Atlanta, Ga.
J. Q. Byram, Indianapolis, Ind.
W. W. Westmoreland, Columbus, Miss.

Committee on Dental Journal.

H. L. Wheeler, *Chairman*, New York city.
W. B. Dunning, *Secretary*, New York city.
C. S. Butler, Buffalo, N. Y.
F. T. Taylor, Boston, Mass.
F. W. Stiff, Richmond, Va.
J. Y. Crawford, Nashville, Tenn.
D. O. M. LeCron, St. Louis, Mo.

National Dental Museum and Library.

G. W. Boynton, *Chairman*, Washington, D. C.
C. A. Hawley, *Vice-chairman*, Washington, D. C.
M. F. Finley, *Secretary*, Washington, D. C.
H. W. Morgan, Nashville, Tenn.
E. G. Link, Rochester, N. Y.
H. T. Smith, Cincinnati, Ohio.
B. D. Brabson, Knoxville, Tenn.
J. V. Conzett, Dubuque, Ia.
J. W. David, Corsicana, Texas.
E. P. Beadles, Danville, Va.

Committee on Oral Hygiene.

W. G. Ebersole, *Chairman*, Cleveland, Ohio.
E. P. Dameron, *Vice-chairman*, St. Louis, Mo.
Richard Grady, *Secretary*, Annapolis, Md.
J. P. Corley, Sewanee, Tenn.
W. A. White, Phelps, N. Y.
H. C. Thompson, Washington, D. C.
Paul G. White, Boston, Mass.

Committee on Necrology.

Wilbur F. Litch, *Chairman*, Philadelphia, Pa.
L. P. Dotterer, *Vice-chairman*, Charleston, S. C.
C. N. Thompson, *Secretary*, Chicago, Ill.
G. S. Vann, Gadsden, Ala.
James McManus, Hartford, Conn.

Committee on Legislation.

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C. W. Rodgers, *Secretary*, Dorchester, Mass.
W. T. Chambers, Denver, Colo.
T. P. Hinman, Atlanta, Ga.
H. C. Brown, Columbus, Ohio.
C. S. Butler, Buffalo, N. Y.
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Committee on Scientific Research.

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Chas. Channing Allen, *Secretary*, Kansas City, Mo.
Joseph Head, Philadelphia, Pa.
H. C. Register, Philadelphia, Pa.
M. C. Smith, Lynn, Mass.

Committee on Publication.

C. S. Butler, *Chairman*, Buffalo, N. Y.
W. R. Clack, Clear Lake, Ia.
F. W. Low, Buffalo, N. Y.

Organization of Sections.

Section I.

Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

Geo. H. Wilson, *Chairman*, Cleveland, Ohio.
Stanley L. Rich, *Vice-chairman*, Nashville, Tenn.
B. Frank Gray, *Sec'y*, Los Angeles, Cal.

Section II.

Operative Dentistry, Nomenclature, Literature, Dental Education, and Allied Subjects.

L. L. Barber, *Chairman*, Toledo, Ohio.
F. I. Shaw, *Vice-ch'man*, Seattle, Wash.
F. L. Platt, *Secretary*, San Francisco, Cal.

Section III.

Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects.

Wm. Carr, *Chairman*, New York, N. Y.
L. F. Luckie, *Vice-ch'n*, Birmingham, Ala.
Richard Summa, *Secretary*, St. Louis, Mo.

Clinics.

F. O. Hetrick, *Chairman*, Ottawa, Kans.
Starr Parsons, *Vice-chairman*, Washington, D. C.
L. A. Crumley, *Sec'y*, Birmingham, Ala.
J. E. Chace, Ocala, Fla.
G. E. Savage, Worcester, Mass.
J. J. Sarrazin, New Orleans, La.
H. H. Sullivan, Kansas City, Mo.
A. O. Ross, Columbus, Ohio.
J. D. Towner, Memphis, Tenn.
J. B. Howell, Paducah, Ky.
L. B. McLaurin, Natchez, Miss.
J. H. Lorenz, Atlanta, Ga.
F. L. Hunt, Asheville, N. C.
J. G. Fife, Dallas, Tex.
W. G. Dalrymple, Ogden, Utah.
R. D. Robinson, Los Angeles, Cal.
C. S. Irwin, Vancouver, Wash.
F. R. Henshaw, Indianapolis, Ind.
H. G. Nottage, Portland, Ore.
F. L. Wright, Wheeling, W. Va.
R. L. Simpson, Richmond, Va.
A. P. Burkhart, Buffalo, N. Y.
S. W. Bowles, Washington, D. C.
T. M. Hampton, Helena, Mont.
J. Bruce Perrin, Des Moines, Ia.
H. B. McFadden, Philadelphia, Pa.

Local Committee of Arrangements.

E. R. Warner, *Chairman*, Denver, Col.
H. A. Fynn, *Vice-chairman*, Denver, Col.
W. P. Smedley, Denver, Col.
W. A. Brierley, Denver, Col.
W. W. Flora, Colorado Springs, Col.
W. T. Chambers (*ex-officio*), Denver, Col.

Chairmen of Sub-Committees.

Publicity—H. F. Hoffman, Denver, Col.
Clinics—A. W. Starbuck, Denver, Col.
Exhibits—John Steele, Denver, Col.
Entertainment—I. C. Brownlie, Denver, Col.

PROGRAM.

The following preliminary program is announced:

Section I.

Weston A. Price, Cleveland, Ohio: "The Laws Controlling the Behavior of Gold in Fusing and Casting."

Discussion by Clarence J. Grieves, Baltimore, Md.; Charles Channing Allen, Kansas City, Mo.; Thomas P. Hinman, Atlanta, Ga.; C. R. Baker, Davenport, Iowa, and Chas. L. Alexander, Charlotte, N. C.

J. Leon Williams, London, England: "Anatomical and Esthetic Prosthesis."

Discussion by C. R. Turner, Philadelphia, Pa.; A. W. Starbuck, Denver, Colo.; B. J. Cigrand, Chicago, Ill.; E. S. Gaylord, New Haven, Conn., and N. S. Hoff, Ann Arbor, Mich.

Levitt E. Custer, Dayton, Ohio: "The Bleaching of Porcelain Fillings."

Discussion by Joseph Head, Philadelphia, Pa.; D. O. M. LeCron, St. Louis, Mo.; Craig M. Work, Ottumwa, Iowa; H. C. Ferris, Brooklyn, N. Y., and J. Allen Smith, Colorado Springs, Colo.

J. Lowe Young, New York city: "Deficient Development of the Deciduous Dental Arches and its Treatment."

Discussion by Lloyd S. Lourie, Chicago, Ill.; Herbert A. Pullen, Buffalo, N. Y.; S.

H. Guilford, Philadelphia, Pa.; F. S. McKay, Colorado Springs, Colo., and Victor H. Jackson, New York city.

Section II.

J. V. Conzett, Dubuque, Iowa: "The Gold Inlay from the Standpoint of a Gold Filling Enthusiast."

Discussion by W. H. Taggart, Chicago, Ill.; Don M. Gallie, Chicago, Ill.; J. Q. Byram, Indianapolis, Ind.; Chas. W. Rodgers, Dorchester, Mass., and J. F. Wallace, Canton, Mo.

Charles Channing Allen, Kansas City, Mo.: "Professional Opportunity."

Discussion by Wm. Carr, New York city; Thos. J. Barrett, Worcester, Mass.; V. E. Turner, Raleigh, N. C.; Chas E. Jones, Chicago, Ill., and J. J. Wright, Milwaukee, Wis.

David Stern, Cincinnati, Ohio: "The Metric System of Weights and Measures."

Discussion by Wilbur F. Litch, Philadelphia, Pa.; John P. Buckley, Chicago, Ill.; Emory A. Bryant, Washington, D. C., and Edwin N. Kent, Brookline, Mass.

James G. Sharp, San Francisco, Cal.: "Some of Our Difficulties and How to Correct Them."

Discussion by B. Holly Smith, Baltimore, Md.; A. J. Cottrell, Knoxville, Tenn.; J. Edward Chace, Ocala, Fla.; R. Boyd Bogle, Nashville, Tenn., and George R. Warner, Grand Junction, Colo.

M. Evangeline Jordan, Los Angeles, Cal.; "Preventive Dentistry for Children."

Discussion by W. T. Jackman, Cleveland, Ohio; Ray D. Robinson, Los Angeles, Cal.; Arthur C. Watson, Denver, Colo.; Garrett Newkirk, Pasadena, Cal., and Celia Rich, Nashville, Tenn.

Section III.

John P. Buckley, Chicago, Ill.: "The Importance of a Correct Diagnosis Before the Therapeutics of Diseases of the Dental Pulp."

Discussion by Edward C. Kirk, Philadelphia, Pa.; A. H. Peck, Chicago, Ill.; F. G. Worthley, Kansas City, Mo.; John R. Callahan, Cincinnati, Ohio, and Frank L. Platt, San Francisco, Cal.

G. V. I. Brown, Milwaukee, Wis.: "Stomatitis."

Discussion by J. D. Patterson, Kansas City, Mo.; L. G. Noel, Nashville, Tenn.; G. V. Black, Chicago, Ill.; W. H. DeFord, Des Moines, Iowa, and Thomas Edward Carmody, Denver, Colo.

Martin Dewey, Kansas City, Mo.: "A Study of the Temporo-Mandibular Articulation, Cusp, and Approximal Contact Points."

Discussion by A. H. Thompson, Topeka, Kans.; W. Bebb, Los Angeles, Cal.; W. E. Walker, New Orleans, La.; F. C. Kemple, New York city; L. P. Bethel, Columbus, Ohio, and H. A. Fynn, Denver, Colo.

Herbert L. Wheeler, New York city: "A Review of the Dental Hygiene Movement, with Suggestions for Increasing its Efficiency."

Discussion by Paul G. White, Boston, Mass.; Edward Everett Haverstick, St. Louis, Mo.; J. D. Towner, Memphis, Tenn., and W. A. White, Phelps, N. Y.

WEDNESDAY, 8 P.M., JULY 20TH.

Open session devoted to Oral Hygiene.

Address—"The Teeth and Health in their Public Relations." By W. A. Evans, M.D., Commissioner of Health, Chicago, Ill.

The headquarters of the Association will be at the Brown Palace Hotel. Rate: Rooms without bath, $2.00 per day; with bath, $2.50 and $3.00 per day. See official program for information regarding other hotels, etc.

All sessions of the Association, clinics, and exhibits will be held in the Auditorium.

Tourists' railway rates are the best we are able to secure. Special train leaves Chicago over the Northwestern at 6 P.M., Saturday, July 16th.

BURTON LEE THORPE, *President.*
St. Louis, Mo.
CHAS. S. BUTLER, *Rec. Sec'y,*
Buffalo, N. Y.

N. D. A. CLINICS.

One of the special features of the clinic to be held in Denver will be the surgical section. Several dental surgeons have consented to give clinics that will be of unusual interest. Arrangements for clinics are ideal.

Dr. A. W. Starbuck, College of Dental Surgery, Denver, Colo., is chairman of the Local Clinic Committee. All clinicians will please write him and let him know the kind of case needed, and find out what they need to take with them. For all chair clinics, cabinets will be furnished, so that the clinician may have a place in which to put his instruments.

We solicit clinics from any member of a state or district society, and if you have not already sent in your name and your subject, do so at once, to any one of the committee.

F. O. HETRICK, *Chairman*, Ottawa, Kans.

[AT DENVER.]

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE twenty-eighth annual session of the National Association of Dental Examiners will be held at the new Savoy Hotel, Denver, Colo., commencing Monday, July 25, 1910, at 10 A.M. The rates will be $2.00 per day for one and $3.00 per day for two persons in room, European plan; large room for one or two with private bath $4.00 and $5.00 per day. Meeting and committee rooms at the service of the association, free, and every accommodation extended.

An early mail reservation is requested, the time being the busy season. A full representation from every state in the United States is earnestly desired.

J. J. WRIGHT, *President*,
Wells bldg., Milwaukee, Wis.
CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

[AT DENVER.]

DENTAL FACULTIES ASSOCIATION OF AMERICAN UNIVERSITIES.

THE annual meeting of the Dental Faculties Association of American Universities will be held in Denver, Colorado, at the time of the annual meeting at the National Dental Association. Meeting at the Brown Palace Hotel, Monday, July 18th, at 9 A.M.

JAMES G. SHARP, *President*,
EDWARD C. KIRK, *Sec'y-Treas.*

[AT DENVER.]

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE National Association of Dental Faculties will meet at the Hotel Shirley, Denver, Colo., Monday, July 25, at 10 o'clock A.M. The Executive Committee will meet to consider business of the association at 9 o'clock A.M. on the same day.

The Hotel Shirley is connected by bridge with the Savoy, where the meeting of the National Association of Dental Examiners takes place on the same date.

The rates will be $2.00 per day for one and $3.00 for two persons in one room, European plan. Large rooms for one or two persons with private bath, $4.00 and $5.00.

B. HOLLY SMITH, *Ch'man Ex. Com.*,
Baltimore, Md.

[AT DENVER.]

DELTA SIGMA DELTA FRATERNITY.

THE twenty-sixth annual meeting of the Supreme Chapter of Delta Sigma Delta Fraternity will convene at the Hotel Savoy, Denver, Colo., Monday, July 18th, at 10 A.M.

R. HAMILL D. SWING, *Supreme Scribe.*

VIRGINIA STATE DENTAL ASSOCIATION.

CHANGE OF DATE OF MEETING.

THE forty-first annual session of the Virginia State Dental Association will be held at Staunton, Va., August 3, 4, and 5, 1910. The change of date is made on account of the meeting in July of the National Dental Association.

Every effort is being made to make this the most interesting and successful meeting of our society. Men of national reputation will give clinics and read papers. All ethical practitioners are cordially invited to attend.

For exhibit space, rates, etc., address the manager of the Virginia Hotel, Staunton, Va.

W. H. PEARSON, *Cor. Sec'y*,
Hampton, Va.
J. W. MANNING, *Ch'm Ex. Com.*,
Norfolk, Va.

NORTH CAROLINA STATE DENTAL SOCIETY.

The thirty-sixth annual meeting of the North Carolina State Dental Society will be held July 13 to 16, 1910, at Wrightsville, N. C. The Seashore Hotel will be the headquarters.

Arthur H. Fleming, *Sec'y*,
Louisburg, N. C.

WISCONSIN STATE DENTAL SOCIETY.

The fortieth annual meeting of the Wisconsin State Dental Society will be held at Ashland, Wis., July 12, 13, 14, and 15, 1910.

Harvey N. Jackson, *President*,
Milwaukee, Wis.
M. L. Christensen, *Sec'y*,
Oshkosh, Wis.

NEW MEXICO DENTAL SOCIETY.

The New Mexico Dental Society will hold its third annual session at Las Vegas, New Mex., July 16 to 18, 1910. On the afternoon of July 18th the society will leave for Denver in a body, to attend the National Dental Association.

Chas. A. Eller, *Sec'y*,
Albuquerque, N. M.

NEW JERSEY STATE DENTAL SOCIETY.

The fortieth annual meeting of the New Jersey State Dental Society will convene in Asbury Park, N. J., at the Casino, July 20, 21, 22, and 23, 1910. This is to be the largest meeting ever held; two days will be devoted to different and interesting clinics, which should not be missed. Many fine and instructive papers to be read. The Hotel Columbia will be the headquarters of the society.

Asbury Park is ideal for the meetings of the society, with its ocean frontage, large and cool. The entire floor of the Casino is to be leveled for the exhibits, which will be many and varied, and everything new will be shown.

Asbury Park can be readily reached by rail, boat, or motor, and will be a good resort for the visitors to bring their families, who will find the hotels large and commodious and the entertainment of a high class, while they attend the meetings. No one can afford to miss this meeting. Prospective members, ethical practitioners of other states, and members of local societies are cordially invited.

For further information address

Charles A. Meeker, *Sec'y*,
29 Fulton st., Newark, N. J.

ILLINOIS STATE DENTAL SOCIETY.

The Illinois State Dental Society held its forty-sixth annual meeting in Springfield, May 17 to 20, 1910. The following officers were elected: Don M. Gallie, Chicago, president; Geo. C. McCann, Danville, vice-president; J. F. F. Waltz, Decatur, secretary; C. P. Pruyn, Chicago, treasurer, and Harry F. Lotz, Joliet, librarian.

The 1911 meeting will be held in Peoria, May 9th to 12th.

J. F. F. Waltz, *Sec'y*,
Decatur, Ill.

AMERICAN MILLER MEMORIAL.

All dentists at home and abroad are debtors to the late W. D. Miller, whose scientific mind, untiring energy, and pride in American citizenship have been potent factors in placing this country at the head of the profession.

Let the old adage, "A prophet is not without honor save in his own country," be the exception in this instance, and let every loyal American be represented in a lasting memorial to his useful life.

The proposed bronze will be erected in the capital city of his native state, that he may share the well-merited distinction of being one of our greatest men.

The invitation to contribute is extended individually and collectively through the societies of the country, and your support, both moral and financial, is urgently solicited.

Executive Committee—Edward C. Mills, Columbus, Ohio; J. R. Callahan, Cincinnati, Ohio; S. D. Ruggles, Portsmouth, Ohio.

In order that the work may be quickly and efficiently accomplished, contributions may be sent direct to the Treasurer of the American Miller Memorial Fund.

Weston A. Price, *Treasurer*,
10406 Euclid ave., Cleveland, Ohio.

MAINE BOARD OF EXAMINERS.

THE Maine State Board of Dental Examiners will meet in Portland, Me., July 5, 1910, for the examination of applicants for license to practice dentistry.

For information address

E. C. BRYANT, *Sec'y*,
Pittsfield, Maine.

VERMONT BOARD OF EXAMINERS.

A MEETING of the Vermont Board of Dental Examiners for the examination of candidates will be held at Montpelier, Vt., July 5, 6, and 7, 1910, commencing at 2 P.M., at the State-house.

For further information, rules, and blanks apply to

J. HOLMES JACKSON,
Burlington, Vt.

MONTANA BOARD OF EXAMINERS.

THE next meeting of the Montana State Board of Dental Examiners will be held at Harmony Hall, Helena, July 11, 12, and 13, 1910, or until the work is completed. All applicants must have their papers filled out and in the hands of the secretary at least ten days prior to the meeting. Patients will be furnished by the board, also engines, vulcanizers, etc. Applicants must furnish their own material, instruments, etc. For further information, blanks, etc., address

D. J. WAIT, *Sec'y*,
Helena, Mont.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the Assembly chamber of the State-house at Trenton, N. J., July 5, 6, and 7, 1910. Practical work on the 5th, and the theoretical examination the 6th and 7th. All applications must be in the hands of the secretary ten days prior to the meeting. Applicants must send preliminary credentials and photograph with the application, or it will not be accepted.

Sessions begin promptly at 8 A.M. each day.

CHAS. A. MEEKER, D.D.S., *Sec'y*,
29 Fulton st., Newark, N. J.

WYOMING BOARD OF EXAMINERS.

THE Wyoming State Board will meet to hold examinations on July 5, 6, and 7, 1910, at the Senate Chamber, Cheyenne, Wyo. All applications must be in the hands of the secretary twenty days before the examinations.

For further particulars address

PETER APPEL, JR., *Sec'y*,
Cheyenne, Wyo.

SOUTH DAKOTA BOARD OF EXAMINERS.

THE South Dakota State Board of Dental Examiners will hold its next regular meeting at Sioux Falls, S. D., July 6, 1910, beginning at 9 A.M., and continuing three days. All applications for examination, together with a fee of twenty-five dollars, must be in the hands of the secretary by June 26th. Applicants who have not complied with the above will not be permitted to take the examination.

G. W. COLLINS, *Sec'y*,
Vermillion, S. D.

NORTH CAROLINA BOARD OF EXAMINERS.

THE next annual meeting of the North Carolina State Board of Dental Examiners will be held at Wrightsville, N. C., commencing on July 11, 1910. All applications for examinations must be accompanied with a diploma from a reputable dental school, which must be filed with the secretary by 9 A.M. on the first day of the meeting.

For requirements and further information address

F. L. HUNT, *Sec'y*,
Asheville, N. C.

HAWAII BOARD OF EXAMINERS.

THE Board of Dental Examiners for the territory of Hawaii will meet at Honolulu on July 30, 1910, for examination of candidates to practice dentistry in this territory.

All applicants must deposit a fee of twenty dollars and be graduates of reputable dental colleges. Copies of the dental law furnished on request.

C. B. HIGH, *Sec'y*,
Honolulu, H. I.

ARMY DENTAL CORPS.

Memorandum of changes of stations and duties of dental surgeons, U. S. Army:

For the week ending May 28, 1910:

Robert T. Oliver, examining and supervising dental surgeon, May 21st, left Fort Hamilton, N. Y., *en route* to Fort Totten, for temporary duty, and arrived at Fort Totten same date.

George D. Graham, May 23d, returned to Fort Des Moines, Iowa, from leave of absence.

Charles J. Long, May 26th, reported for duty at Fort Adams, R. I.

For the week ending June 4th:

George H. Casaday, May 25th, relieved from temporary duty at Fort Rosecrans, Cal., and to return to the Presidio of Monterey, Cal., for duty. When his services are no longer needed at the latter post, will stand relieved and will proceed to Army General Hospital, San Francisco, Cal., for duty.

George H. Casaday, May 28th, left from duty at Fort Rosecrans, Cal., *en route* to Army General Hospital, San Francisco, Cal., for duty.

George D. Graham, May 29th, returned to Fort Leavenworth, Kansas, from duty at Fort Des Moines, Iowa.

For the week ending June 11th:

Clarence E. Lauderdale, detailed to represent the dental corps of the army at the meeting of the National Dental Association, to be held in Denver, Colo., July 19 to 22, 1910.

Charles J. Long, will proceed from Fort Adams, R. I., to Forts Bank and Rodman, Mass., to render dental service in the artillery districts of Boston and New Bedford.

George I. Gunckel, ordered to Fort Screven, Ga., for a period of three weeks.

For the week ending June 18th:

Robert T. Oliver, examining and supervising dental surgeon, U. S. Army, June 15th, relieved from duty at Fort Hamilton, N. Y., and ordered to the Philippine Islands for duty.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING MAY 1910.

May 3.

No. 956,843, to Edward B. Crane. Denture.

No. 957,032, to Wm. J. Brady. Dental attachment.

May 10.

No. 957,563, to M. M. Kerr. Impression tray.

No. 957,671, to Isaac M. Hair. Dental cuspidor.

May 17.

No. 957,913, to S. G. Supplee. Denture.

No. 958,048, to Henry E. Weber. Dental chair.

No. 958,371, to D. H. Danek. Tooth-brush.

May 24.

No. 959,191, to James H. Abbott. Dental brush.

No. 959,352, to O. L. Kellett. Hydraulic motor for dental engine.

No. 959,365, to E. C. Lombard. Dental forceps.

No. 959,395, to Pauline Schaefer. Tooth-crown.

No. 959,416, to James H. Abbott. Dental brush.

May 31.

No. 959,534, to Gustav Holtz. Dental-bracket tray.

No. 959,574, to Jos. F. Moore. Tooth-brush.

No. 959,608, to Frank Ritter. Dental chair.

No. 959,641, to David Stern. Switch-board for dental, medical, or surgical purposes.

No. 959,684, to Wm. Adelman. Dental mouth-prop.

No. 960,236, to B. G. Simmons. Dentists' cotton-holder and waste-receptacle.



MEMORIAL TO DR. HORACE H. HAYDEN.

(Erected at his birthplace, Windsor, Conn. Dedicated June 25, 1910.)

THE

DENTAL COSMOS.

VOL. LII. AUGUST 1910. No. 8.

ORIGINAL COMMUNICATIONS.

ETHICS.

By GILBERT S. DEAN, D.D.S., San Francisco, Cal.

ON returning to life after a long illness, I find myself welcomed. Says Dr. Ottolengui (DENTAL COSMOS, February 1910, page 214): "Dr. Dean wrote a classic on the subject of ethics which you will find in the July 1893 DENTAL COSMOS; I commend the reading of that paper to you."

Reference to the DENTAL COSMOS of July 1893 shows that I did at that time present to the profession a paper on the subject of ethics—a paper which may have the merit, ascribed to it by Dr. Ottolengui, of being "an example of ethical discussion." But when today I look over that paper, I note that it subserves rather than achieves its purpose—which purpose was the opening for rational discussion of the "burning questions" of professional ethics. Among its shortcomings, I note in particular a basal fault; I note that it does not fulfil the first requisite for the introducing of the parts of a subject for rational discussion—which requisite is the giving of a clear definition of the subject as a totality. Presumably, at the time of the writing of the paper, I was not able to clearly define ethics.

The recent discussion of the subject of professional ethics has brought to light the fact that I am not the only person who has proved unequal to the task of giving a clear definition of ethics. The paper on professional ethics, by Dr. Safford G. Perry, which appears on the first page of the DENTAL COSMOS for February 1910, opens with a going to the defining authorities, with the result of presenting the following attempts to give a definition of ethics: Standard dictionary, "The science of human duty"; Professor Birks, "The science of ideal humanity"; Century dictionary, "The doctrine of man's duty to himself and the rights of others"; Encyclopedia Britannica, "Ethics is concerned with what is 'good' or 'what ought to be.'"

It is noticeable that not one of these attempts to define, nor indeed the whole of them as a cluster, gives us a clear view of the character of ethics and the subject-matter of ethics and the scope and the limitations of ethics. If we should judge solely by the definitions presented by Dr. Perry, we would form a belief that, at the present time, nobody knows what ethics is. The shortcoming of these

definitions, now theoretically seen, will appear more vividly later—after an endeavor which I shall make to give the true definition of the word.

The entering upon the discussion of a subject without knowing what the subject is, is unsatisfactory. We have at times, in difficult matters, to grope—to do the best we can without the aid of reason. But when we know, when we fundamentally know, what we are to talk about; when we are prepared to really think on the subject; we are in better condition.

Because of the evidence presented by Dr. Perry that our men of higher education are fundamentally deficient in knowledge of ethics, it has seemed to me desirable to open the subject of ethics—with its sub-subject of professional ethics—to the profession. Especially has it seemed to me desirable to do this because the evidence which appears in the quotations made by Dr. Perry is far from being the entire evidence that the educated world is at the present time in a state of ignorance on this subject of exceeding importance. Says Professor Albion W. Small, who is the latest and one of the most able of the world's great writers on general ethics, and who is fully informed of all which has been accomplished up to the present time by the world's greatest intellects in the study of ethics: "Society is ethically bankrupt" —meaning that the educated world's present knowledge of ethics, foundationless and fragmentary, is inadequate. He proceeds to say: "We have some ethical assets, but they are a small percentage of our ethical liabilities." And he characterizes our present knowledge of ethics as "a collection of provincial moralities" —his characterization being, and being intended to be, an eloquent presentation of the educated world's present ignorance of ethics.

But why should I assume that I am able to define what the authorities are unable to define? And why should I assume that I am able to give a better definition of ethics now than I gave seventeen years ago? And why should I assume that I am able to give acquaintance with a subject which is explicitly said by its highest authorities in the world of learning to be at the present time a *terra incognita?*

It happens that I have recently become fitted for the opening of this subject. On the return of health, I deemed it my first duty, a duty prior to that of doing anything else, to make an extensive original study, a search for the fundamental art of which the world's leading intellects proclaim the world's present lack and need—the art of thinking. Having found the necessary art of thinking, I put it to use; with its guidance I traversed a great subject which has hitherto been impenetrable—which has been and is the despair of leaders of thought—the subject of society. The result of this traversal—the science of society—is the foundation of ethics. On the science of society—"sociology"—rational ethics must rest. Hence, to one possessed of the science of society, the subject of ethics —"scientific ethics"—is an open field; and of course, on the other hand, in the absence of its underlying science, the subject of ethics is not penetrable by anyone—nor does it make any difference how great his native intellectual ability—witness the result of Herbert Spencer's lifelong effort to understand the subject of ethics, of which result Professor Small speaks as "Spencer's failure."

In what I have just written, there is a basis for approaching the defining of ethics. If ethics rests on science, then, presumably, ethics is not science.

And that ethics is not science, appears immediately that science is defined. Science is fact-knowledge. This brief statement is a perfect definition of science. All fact-knowledge is science. All which is not fact-knowledge is not science. And the term "fact-knowledge" is so distinctly descriptive that every person will instantly and certainly know its meaning. There is small fact-knowledge and there is great fact-knowledge; there is particular fact-knowledge and there is general fact-knowledge; there is simple fact-knowledge and there is complex fact-knowledge; but, whatever its adjectival character, it is all fact-knowledge—and

it is all known as fact-knowledge. And there is no debatable ground between fact-knowledge and the other kinds of knowledge. Between fact-knowledge and the other kinds of knowledge there is a sharp dividing-line—an impassable gulf.

All knowledge is of one of three kinds: 1, Desideratum-knowledge; 2, Fact-knowledge; 3, Action-knowledge. Desideratum-knowledge and action-knowledge coalesce. Fact-knowledge is a thing apart.

Ethics is usually said to be a thing of "rules"—of "rules of conduct." It may be more than this; but it is certainly this. Rules are for guidance—for guidance of action. And action-knowledge—"precept," "commandment"—is not fact-knowledge; it is not science.

Ethics, formulated ethics, is knowledge. It must be knowledge of some kind. As it is not fact-knowledge, what kind of knowledge is it? Opposed to science or fact-knowledge stands desideratum-action knowledge—a coupled or united knowledge. There are no other kinds of knowledge. As, then, ethics is not fact-knowledge, it must be desideratum-action knowledge.

No language known to me presents a word which unequivocally expresses this knowledge-couple—desideratum-action knowledge. Man's knowledge of knowledge is small; and lack of knowledge involves lack of nomenclature. But languages generally contain an equivocal word which has desideratum-action knowledge as one of its meanings. The English word is "wisdom." If we take "wisdom" to signify desideratum-action knowledge, we may divide all knowledge into two kinds: 1, Science; 2, Wisdom. Then we will say that ethics is not science, but is wisdom.

Desideratum-knowledge, considered alone, has no distinct name; but the ambiguous and somewhat peculiar word "philosophy" (*φιλοσοφία*—literally, "love of wisdom"), has been used to express it. To action-knowledge, considered alone or as nearly isolated as possible, logicians have given a name; they call it, as opposed to fact-knowledge or science, "art."

We may say that ethics, considered as a body of rules of action, is an art. It is a matter of "Do this" and "Do not do that"—implying desiderata to be attained, but presenting action. We will say, then, that ethics is, not science, but art.

Arts are many. There is the art of cooking, the art of dancing, the art of drawing, the art of printing, the art of engine-building, the art of thinking—and many other arts—including the art of healing. Every art has what may be called a "subject-matter." What is the subject-matter of the art of ethics?

Let us not answer that the subject-matter of ethics is "morality" or that it is "duty," and then endeavor to ascertain what men mean by the word "morality" or the word "duty." The title of the opening chapter of Part II of Herbert Spencer's "Principles of Ethics" is "The Confusion of Ethical Thought." Let us avoid this current "confusion." Let us put aside words which are used in "confusion," and let us look at the facts of nature. As the statements of those who are most fully informed are all to the effect that man at the present time does not understand the subject of ethics, let us put away all ready-made knowledge of the subject; let us shun a knowledge which, we may confidently expect, will blind us or warp our vision; and let us go direct to nature for all our information;—let us look direct at nature, and, with unwarped vision, see.

As ethics is rules of action, let us ask what action it is of which ethics is the rules.

The answer is immediate. The action which is the subject-matter of ethics is action which concerns others; it is action which concerns beings other than the person who performs the action. The action which is the subject-matter of ethics may concern other men, or it may concern deities or angels; but, in any case, it concerns at least one being other than the person who does the act or acts.

This answer "characterizes" the action which is the subject-matter of ethics. Let us see what it means.

Robinson Crusoe could not act ethically—nor unethically—till Friday came to the island. With the coming of Friday,

came the possibility of ethical action. Robinson Crusoe could act ethically—or unethically—toward Friday. The kind of action which is the subject-matter of ethics is now more distinct; it is action "toward" or "with relation to" another.

But the mere presence of another does not give the possibility of ethical action. Suppose that Friday had come to the island for the purpose of killing Crusoe—with the result of a "struggle for existence" between the two men. In that case, the killing of Friday by Crusoe would not have been an unethical act—nor an ethical act. Mere presence, then, is not the condition of possible ethical action; the presence must be amicable—at least, not fatally inimical.

The action which is the subject-matter of ethics is, then, action toward what may be called an interested person—a "member" of the "group." If there is no group, there can be no ethics.

The kind of action which is the subject-matter of ethics is now perfectly clear. It is social action. It is the action of the individual as a member of a society—not necessarily an organized society, but a "group."

The society may be composed of only two individuals—for instance, a pair of birds (who are usually extremely ethical); or it may be composed of the entire population of the globe—for instance, the great modern group which is called "humanity." But a group there must be in order that there may be ethical action.

We are now able to define ethics considered solely as a body of rules of action. Ethics is the correct body of rules for social action—for, if the word is preferred, social "conduct."

All-embracing is social action. Into everything which the grouping person does extends ethics. Every act of the group-member concerns others; hence every act of the group-member is ethical or unethical—is not merely "good" or "evil," but is "right" or "wrong." Even conditions of the grouping individual—as being asleep or awake at certain times—may concern others, and may hence be ethical or unethical—"right" or "wrong."

Having seen the scope of ethics, let us, for clearness, re-define.

Ethics is the correct body of rules of that action which directly or indirectly concerns another to whom the person is in a social relation.

In this definition we note an indefinite word. That word is "correct." In what consists the "correctness" of a body of social rules?

Plainly, the question just asked is vital.

The direct answer is immediate. A "correct" body of social rules is a body of rules which prescribes a correct body of social action. Correctness of the rules means correctness of the directed action.

But this answer only transfers the problem. In what, we must ask, consists the correctness of social action?

Social action is a part of biologic action. To find what correctness in social action is, we must find what correctness in all biologic action is. Our question is here limited to that action which is the subject of "rules"; that is to say, our question concerns only intelligent or rational action. Our first question thus becomes: In what consists the "correctness" of all rational action?

Rational action is action in view of a desirability or "desideratum." The correctness of the action is its direction toward the attaining of the desideratum.

We may now apply the general truth to the special case. We may say that correctness of rational or guided social action is direction of the social action toward the attaining of a desideratum—and that, hence, rational ethics is the body of rules which directs the person to act to the best advantage for the achieving of a desideratum.

What, then, of the desideratum at which rational ethics should aim?

What is the desideratum which, as opposed to "general biologic," we may call "social"? Is it a single desideratum? Or, is there a plurality of social desiderata? Is there a body of social desiderata? Is there a plurality of bodies of social desiderata?

These questions cannot be here answered. It must suffice to say that, as

the subject-matter of ethics is social action, when the world shall possess the science of society, it will know what is the desideratum or what are the desiderata to the attainment of which rational ethics must direct action; and that, till the world shall possess the science of society, it is not likely to become acquainted with this desideratum or these desiderata. Most of the world's great students of ethics, from Plato and Aristotle to Wilhelm Wundt and Herbert Spencer, not being possessed of the science of society and hence not being able to find the desideratum of ethics, have assumed a desideratum. We are not to censure "speculation" where knowledge is unobtainable; but it is right for us to prefer, with regard to the social desideratum or desiderata, the reaching of certainty or assured knowledge through science.

We may, then, leave in abeyance for the present the special question of what the social desideratum or desiderata is or are. And we may note only this fact: In order that there may be a positive society—neglecting here the matter of possible negative society,—there must be at least one desideratum which every capable member of the society seeks. The word "member," here, does not include social parasites or social saprophytes who live at the expense of or by the toleration of the society; it includes only those who "make" the society. These—the "members"—must all be actuated by at least one common desire; they must have at least one common desideratum.

Preparation for definition has now been completed; and ethics—in the sense of rational ethics—may now be defined.

Rational ethics is the body of rules which directs or will direct action to the attainment of the desideratum or desiderata of social life.

This definition, it is to be noted, covers rational ethics only.

Is there more beyond? Have we not seen the whole of ethics? We will ask that question presently. Here let us differentiate rational ethics. Let us find, in rational ethics, the place of rational professional ethics.

At this point, then, we take leave of rational ethics as a totality, and pass to the sections of rational ethics.

Are there sections of rational ethics?

The answer must come from the science of sociology. Are there what may be called "social classes"? If so, there are sections of ethics; because the ethics of different social classes must differ.

Sociologists do not teach that there are social classes; they teach, indeed, that there are no social classes—or, that there have been social classes, but that social classes are disappearing and that we have practically to do with a world devoid of social classes. Passing from men of science to the common people, we find that they proclaim that, in America at least, there are no social classes. But, when we are on truth intent, we will accept no ready-made teaching; we will use our own eyes. Let us, then, look at the facts. We see that there are, in America, parents and children; and that these are visibly two social "kinds" of persons—two classes of persons who are necessarily different in the matter of their "social relations." It appears, then, that the population of America is not absolutely homogeneous in the matter of "social status." And when we note that, among adults, there is "leadership" and "following" which simulates the "parent" and "child" phenomenon, we cannot but suspect that inquiry would bring to light something of heterogeneity in the social relations of those who are grown up.

For the truth with regard to social classes, we must look to the science of society—a science which does not yet exist, and for the production of which its leading exponents say that the art of thinking is not yet adequately developed. Yet we must have the science-truth with regard to social classes in order to differentiate ethics. Let us therefore, in the absence of the required science, assume. Let us assume that the cardinal social classes are: 1, Rulers; 2, Ruled; 3, Protectors; 4, Protected; 5, Companions; 6, Buyers and sellers—"traders." These, in fact, when the science

of sociology shall appear, will be found to be the chief social classes.

On the basis of this sociologic classification, ethics will divide itself into: 1, General ethics or membership ethics—the common ethics of all members of the society; 2, The ethics of command; 3, The ethics of obedience; 4, The ethics of protection or "giving"; 5, The ethics of reception; 6, The ethics of companionship; 7, The ethics of trade. It is to be noted that the same individual may be both ruler and ruled, and at the same time protector and protected, and companion, and trader; and may be these in different degrees—and that hence different class-ethics may apply simultaneously to the same person. (It is because of the apparently hopeless complexity of social facts that society has hitherto defied analysis.)

Where, now, in class-ethics, is the place of professional ethics?

The professional man is a protector. The parent, the priest, the attorney, the trustee, the guardian—these are protectors. When the priest becomes the physician, he does not cease to be a protector. When the guardian becomes the teacher, he does not cease to be a protector. It may be said that the modern physician and teacher are traders, that they are servants or sellers of services rather than direct protectors; and it is true that they are traders; but it does not follow that the professional man is nothing more than a contract-servant of individuals from whom he receives money; and if it should be admitted that he is no more than this, the fact would remain that he is a servant of protectors, and that he is a trusted servant, and that he therefore must be a protector.

We ought here to see—not merely to "assume," but to "see"—the sociologic character or quality of the professional man. A truth once seen is forever after visible; it is "recognized" wherever it is met; and, apart from extreme metamorphosis, it is recognized in whatever combination or guise it appears. We ought to become able to "recognize" the professional man, and this, even though he be combined with the trader or with other sociologic "kinds"; and it would be well that we should not merely "assume" but "see" whether there are or are not "social classes." Even the briefest or most summary analysis of society is an undertaking far too extensive and too recondite to be here presented—and its results would be too startling in their novelty to allow of presentation without preparation. But, after having had a suggestion as to the "kind" of sociologic factor which the professional man is, we may take a short cut to the seeing of that truth—with incidental seeing whether sociologic "kinds" or "social classes" do or do not exist. It is a cardinal principle of the art of thinking that, to see a thing or make its acquaintance, we must isolate it; and it is another cardinal principle that, to see a thing clearly, we must intensify it. With these suggestions for "seeing," let us look at professional life in isolation and in its greatest intensity and prominence; let us see the "pure" professional man, in a position where he is conspicuous and where he impresses himself most deeply upon the attention. Such instances—great teachers, great priests, great physicians—are easy to find; history presents them abundantly; they must be numerous, because the progress of society and even the existence of society depends on them; and numerous they are. From the days of Socrates to the present moment, great instances of pure professional life are clearly before the world. In every crisis of human affairs the pure professional man comes forth conspicuous. In the year 1632, when England was free from plague, a case of the disease appeared in the village of Eyam in Derbyshire. Charles Mompesson, the priest-physician of the village, saw the patient, recognized the disease, saw the danger of its dissemination to other towns. He summoned the people to the church, told them that plague had broken out in the village, told them that the rest of England was free from the disease, and told them that it was their duty to remain at home and not to flee and carry the disease to other places. The people promised to stay if Mompesson would re-

main with them and care for the sick and bury the dead. He replied that he had never thought of going away, and that they could rely on his remaining with them to the last. All agreed to remain. A voluntary quarantine is a rare thing in human history; the layman usually tries to save himself at whatever expense to others, but in this case the professional man imbued the entire parish with the professional spirit. For more than a year the funeral bell rang in the village; and during that time the voluntary quarantine was maintained. The family of Mompesson was broken by death from the plague; but Mompesson himself lived and worked to the end. At last, Eyam, decimated by death, but plague-free, opened communication with the rest of England. I have not cited this instance of professional life because it is unusual; I have cited it because it is usual; I have cited it because it is universal; I have cited it because it shows the professional man as he is always and everywhere. He was not, in this instance, martyred by an unappreciative laity, as he often is—put to death, and perhaps afterward monumented. Nor did he, in this instance, starve, as he often does, in seeking to serve a world which disregards him. But his course in this instance was his course in every instance—the course of seeking, not his own welfare, but the welfare of those whom he lives to benefit—the course of seeking the welfare of his people, of the public, of the world. Whether it be the St. Paul or the Spinoza, whether it be the Demosthenes, the Hipparchus, the Napier, the Elizabeth Fry, the Giordano Bruno, the John Hunter, the Thomas Paine, the Jeremy Bentham, the Herbert Spencer, or whether it be any other of the multitude of great priests, physicians, teachers, whose names could be mentioned—and whatever be the country or the time or the special kind of the work to which the professional man is devoted,—the course of professional action is the same; it is, uniformly, the course of seeking to aid, as opposed to the course of seeking to despoil. We see, and we see only, in contrast. That we may clearly see the professional man, let us place him beside the unprofessional man—beside the "man" of the science of economics or political economy—beside the pure "wage-worker," the "quack," the "hireling" who "fleeth because he is a hireling and careth not for the sheep." Beside the pure professional man whose sole aim is to give, place the man whose sole aim is to get—the man who for money does a business which for aught he cares may be injurious to everybody except himself—say one of the men who, in San Francisco shortly since, in order to get gain for themselves, destroyed the property of others and promiscuously killed and wounded and otherwise injured men and women and children, manifesting complete indifference to the suffering or the amount of the suffering of any person except themselves and showing only the wish that they themselves should get money. In this contrast, what the professional man is, appears clearly.

Having seen the "pure" professional man, we are "acquainted" with the professional man. Being "acquainted" with him, we can "recognize" him; we can recognize him even though the professional element exist in combination with some one or more of the other sociologic elements. And, seeing what the professional man "is," we can "characterize" him. We see him to be, as a professional man, a care-taker of others; we see him to be, not a self-seeker, but a giver; we see him to be that which, for the convenience of single-word expression, we may call a protector.

Professional ethics is, then, primarily, the ethics of protection.

But professional ethics cannot be dictated exclusively on the ground of the professional man's position in the great society. The professional man is united with other professional men—here overtly, there tacitly. That is to say, he becomes a member of a sub-society within the great society. He becomes a member of a subordinate society—organized or unorganized—of professional men. Here is a basis for a second branch of professional ethics.

The basis of association—the basis of positive "society"—must be at least one desideratum. When a society is formed within a society, the essential basis of the sub-society must be the essential basis of the containing society. But the sub-society may rest on other desiderata also—these other desiderata not conflicting with the desideratum of the great society.

Thus the members of a profession become more or less widely united on the basis of a common desideratum or body of desiderata; and their society—which may or may not be organized—is, if ethical, substantially a member of the great society.

What, now, of the rational ethics of the members of the subordinate society as such members? What, that is, of their reason-directed conduct toward their sub-society and toward each other? Plainly, the same must be said here as in the case of the great society—that there is a general membership-ethics and a special ethics dependent on the positions of the members in the sub-society. The professional society is, however, usually, so nearly homogeneous that the special ethics due to special position in it is relatively small—and that the ethics of the member of this sub-society as such member may be regarded as little more than its membership-ethics.

Membership-ethics is the same for every society of the great class to which the professional society belongs. Its first great precept is: Serve the desideratum of the society. Its second great precept is: Aid and defend every member of the society.

Thus, if the desideratum which is the basis of the professional society is increase of the usefulness of its members—increase of the will and the ability of its members to serve the public,—the two great precepts of the internal ethics of the profession are: 1, Do your part toward increase of the good-will and the ability of all members; 2, Give assistance to other members of the profession, and protect their reputation, their persons, their property—whether this property be ideas or whether it be tangible goods.

We have now completed traversal of the subject of rational ethics.

At this point we properly ask the question: Have we seen the whole of ethics?

Taking, now, rational ethics as a whole, we must see it in its place—in its external relations.

The subject-matter of ethics is social action. Looking at the whole of social action, we ask: Is formulated or rule-directed social action the whole of social action?

The answer, immediate and beyond doubt, is: No.

The ant is a most ethical being—is cited as ethically superior to man by Herbert Spencer in his "Principles of Ethics;" and the ant has "no guide, overseer, or ruler." The greater part of the social action of man parallels the entire social action of the ant in being undirected—"instinctive."

Is ethics, then, not wholly a matter of dictated rules? That depends on the definition which is given to the word "ethics."

The word "ethical" is commonly applied to social action as a whole. The word "ethics" is restricted to rules.

We find, here, word-confusion.

Moreover, we find ourselves in a state of word-poverty. If we restrict the word "ethics," as it seems that we must, to formulæ or rules, then we need two other words to express the entirety of social guidance; we need a word to express that part of social guidance which is not "ethics," and we need a word to express social guidance as a totality.

That which is important, however, is, not words, but facts. Let us know the truth concerning what we may call "the matter of ethics."

Before there is formulated "ethics," there is "ethical conduct." We see this in sub-human life; and we see it in primitive human life—in such matters as the rearing of children. And, when primitive human life is left behind, when formulated rules appear, unformulated ethical conduct does not cease. On the contrary, unformulated ethical conduct persists, and not only persists but evolves—becoming great and complex; it con-

tinues to cover the basal portion of social life, and it so grows and develops as to cover mainly the balance of social life.

Here we come to the matter of social quality or "character"—that from which the word "ethics" springs.

The social "character"—in the ant and in the man—is the body of social instincts. If this—the social "character," the body of social instincts—is right, the social conduct is right; it is right "spontaneously"; there is no need of formulated ethics.

The utility of formulated ethics is to direct social action where the social "character" fails to direct.

Man acts aright socially, in the main, without being directed; and he must so act, or there would be no society. But man's undirected right action has two limitations, the first being that of novelty—the man finding himself in a new position, in which he "does not know what to do;" the second being that of false instinct—some "tendency" of the person being out of accord with the needs of the society.

At this point, we see the position of rational ethics in the totality of social guidance.

Reverting to social guidance as a totality, we note that it begins as instinctive social guidance, and that it is to the end, in the main, instinctive social guidance; and that formulated social guidance comes to supplement instinctive social guidance by reason of two needs due to two limitations of instinctive social guidance—its use being: 1, To give social direction where social instinct is at a loss; 2, To extinguish wrong social instincts and to cultivate right social instincts—producing the "right character."

We have now traversed the subject of ethics.

Let us turn and synopsize.

Before synopsizing, I may say that I have, in order to secure brevity and simplicity of presentation, spoken as if society and therefore ethics was unitary; but that in fact society is not only complex as a result of evolution, but is also basally complex, it being produced by the union of four distinct trunks—the branches of which evolve separately; and that hence ethics is not basally unitary, but is composed of four distinct systems of ethical desiderata and guidances—which are brought into unity by organization under the supremacy of one class of desiderata, but which antagonize one another and produce conflicts of desiderata and duties and social instincts, some of which conflicts we witness every day and every hour in practical life. In a word, ethics is by no means a simple subject, to be fully presented, even in its great outlines, in a few pages; but the human intellect requires simplicity and graspability of presentation, and to meet these needs of the intellect I have in this paper presented ethics as unitary—as evolving from a single embryo or stem. To accommodate the need of the intellect for simplicity of presentation, it is desirable to primarily present the orbits of the planets as simple ellipses or even to construct a primary orrery which shows the orbits of the planets as simple circles; and, for the same reason of meeting the needs of the intellect, it is desirable to primarily present ethics as simple—leaving complexity to appear later.

Let us now proceed to synopsize.

Our traversal of our subject has been made, necessarily, by the synthetic method—the reverse of that which when practicable is the method of choice. The making of our traversal synthetic renders necessary the making of our synopsis broadly analytic. The synopsis should begin with the subject-matter of ethics as a totality within its containing totality—the containing totality being biologic guidance as a whole; and it should proceed to divide ethics, and to note its parts and their inter-relations.

Let us, in our synopsis, not concern ourselves with words. Let us look only at the facts.

The containing totality, of which the subject-matter of ethics is a part, is biologic action. The subject-matter of ethics is a department of biologic action; it is that part of the total action of life or total action of the person which has reference to others with whom the

person is in what may be called a living relation. In a word, the subject-matter of ethics is the action of the individual as a "member of society." The great facts of nature with regard to biologic action in general are the great facts of nature with regard to the biologic action which is the subject-matter of ethics; the chief relevant of these facts being that the action begins as small and simple instinctive action, and that the action evolves—with the final result of addition to the instinctive action of intelligent action. Instinctive action is "spontaneous" in its guidance; and this, true everywhere in life, is true in the domain of ethics. Intelligent action is non-spontaneous in its guidance; it is directed to an "end"; it is action deliberately "planned" to achieve a desideratum; and this, true everywhere in life, is true in the domain of ethics. With the arrival of intellect, social action becomes directed by "rules." Assuming that the desideratum of the intelligent society is clearly seen, the formulated ethics of the society will be a body of rules intelligently directed to the achieving of this desideratum. We now have intelligence directing the social action or "conduct" of the person; and, as instinct does not go out of existence when intellect appears, we have, in the intelligent society, instinct and intellect together directing social action. In the evolved intelligent society we find that social classes exist; and, pending the arrival of the science of sociology, we assume that these social classes are six in number—with the result that there are six systems of class-ethics: 1, The ethics of command: 2, The ethics of obedience; 3, The ethics of protection or giving; 4, The ethics of reception; 5, The ethics of companionship; 6, The ethics of trade. Resuming now the synoptic viewpoint, we see ethics as a great system, composed of a dominant general system and a number of tributary special systems; and we see, extending through both the general system and the special systems, intelligent guidance and instinctive guidance. We also see the places in social guidance of intelligent and instinctive guidance. We see intelligent guidance, not as fundamental, but as secondary—as an adjunct to instinctive guidance, an aid to and a corrector of basal guidance. We see as the supreme matter in social guidance ethical instinct—social "character";—with the result that we expect to find, as the most important of the absolute uniformities of human history, this: When the instinctive social guidance of the members of a society fails—when the "character" of the people fails,—the society perishes.

We, as professional men, are especially interested in knowing the kind or nature of professional ethics, the chief branches of professional ethics, and the location of professional ethics. Professional ethics is, in kind, the ethics of protection. Professional ethics has two main branches—the ethics of the professional man with regard to the great society, and the ethics of the professional man with regard to the sub-society of professional men. The location of the ethics of a profession is that of subordination to the general ethics of the great society. It is desirable to explicitly note, in conclusion, the facts that professional ethics is both instinctive and rational, and that its essential is instinctive rightness—character-guidance. By the last note, I may add, the scientific study of ethics justifies Dr. Ottolengui's teaching that the professional man should be, inherently, a gentleman.

CLINICAL EXPERIENCE AND OBSERVATIONS IN THE TREATMENT OF PYORRHEA ALVEOLARIS.

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BY way of introduction it is well to say that pyorrhea alveolaris is a term generally used, for want of a more correct one, as the name of a most common disease of the tissues surrounding the teeth. It is primarily a disease of the pericemental membrane, and in all of its stages and forms this membrane is the tissue most affected; hence the name pericementitis, with its qualifying adjectives indicating the symptoms or marked characteristics of the several forms of the disease, is most appropriate when discussing these forms. I will therefore use the terms "ptyalogenic calcic," "hematogenic calcic," and "phagedenic" pericementitis as the names most applicable to the three recognized distinct forms of the disease. As I propose to discuss the subject as a whole, using the distinct names only to refer to the three forms, I will define each and give its characteristic symptoms.

PTYALOGENIC CALCIC PERICEMENTITIS.

Ptyalogenic calcic pericementitis is that form of the disease which manifests itself first in a marginal gingivitis, acute or chronic, induced by some local irritant of a mechanic, chemic, or septic nature, augmented by a low vital resistance, temporary or prolonged, followed by a very hard, dark calcic deposit on the neck and root of the tooth. As the deposit increases or extends toward the apex of the tooth, the gum becomes hyperemic, swollen, and everted, and may be purplish in color. The pericementum is inflamed and is absorbed as the deposit proceeds, the alveolar process is absorbed at the margin, and the gum recedes. Infection takes place and there is suppuration and destruction of the pericementum, necrosis of the alveolar process, ulceration of the gums, and a discharge of fetid pus. The teeth may loosen and fall out or may have to be extracted. These conditions may occur on one tooth, on several, or on all the teeth in the mouth.

HEMATOGENIC CALCIC PERICEMENTITIS.

Hematogenic calcic pericementitis is that form of the disease which manifests itself in a dark calcic deposit on the roots of teeth, in a position not connected at first with the secretions of the oral cavity. The deposit, acting as a mechanical irritant, sets up an inflammation that usually results in an abscess and absorption of the alveolar process over the affected area. The abscess may point on the gum or discharge by the neck of the tooth, particularly in the upper arch. This form is believed to be due to the rheumatic or gouty condition of the system, which causes the calcic deposit to take place in the pericementum.

PHAGEDENIC PERICEMENTITIS.

Phagedenic pericementitis is that form of the disease that is characterized by a progressive ulceration of the pericementum, beginning at the neck of the tooth and proceeding toward the apex of the root in narrow pockets, by a discharge of pus with the odor of caries of

bone, and by disintegration of the overlying alveolar process, which leaves its margins rough and irregular. The tooth loosens, moves or rotates from the side affected, and in the latter stages becomes sore and elongated. The gum remains intact in the early stages, has a congested or bluish look, and if the acute form subsides, later recedes or ulcerates, exposing the surface of the root to the apex or as far as the process is destroyed. There may or may not be deposits on the root. The disease may attack one or several teeth in the mouth at the same time, usually bilaterally, though never all at once. This form is considered infectious, and it may be localized by taking hold of any inflamed area of the gum or pericemental membrane.

POINTS IN THE TREATMENT THAT ARE GENERALLY AGREED UPON.

The leading authors on pyorrhea alveolaris differ as to the immediate cause of the disease in its several forms, as to the *modus operandi* by which the manifestations are produced, as to the extent of the influence of systemic conditions upon its production, some claiming cause for effect and *vice versa;* but there are some common points in the treatment of the disease in each of its forms that seem to be agreed upon. They are (1) the removal of all irritants, (2) the frequent cleansing and disinfection of all pockets, (3) the local use of antiseptics and stimulating astringents, (4) the correction of all pathological conditions of the system in which the percentage of red blood corpuscles is below the normal, and (5) the correction of all systemic conditions that interfere with normal metabolism.

The first three of these points are strictly within the field of dentistry; the fourth and fifth are optional with the dentist. If he is sufficiently versed in the medical branches and wishes to treat these conditions it is within his province to do so, but few dentists indeed have had the proper training for such systemic work, and therefore, as a rule, it should be referred to a competent physician.

To the older practitioners of dentistry, who have treated pyorrhea alveolaris for years, it would perhaps be useless to describe or give the procedure in treatment of the several forms, but at the risk of tiring some of the "sages," and with the hope of having some of my own errors pointed out, at the same time giving some suggestions to those who have not traveled so far on this troublesome road, I will give some of the essential details of treatment.

DIAGNOSIS.

If a patient presents with a local or general marginal gingivitis, serumal calculus below the gum, and a history of several months' easy bleeding, the case is one of incipient ptyalogenic calcic pericementitis, and I would treat it as such.

At the first sitting, or before any work is done, the case is diagnosed. The form of the disease is determined, careful inquiry into the history of the case is made, and note taken of any systemic conditions that may be suspected of contributing to the cause, or that might operate as a barrier to the successful treatment of the case. If systemic conditions are found or believed to exist which need correction and which the dentist is not wholly or positively capable of correcting, a competent physician is called into the case and the patient turned over to him for treatment. The habits of the patient are inquired into, and if there be anything that prevents the normal amount of sleep or of exercise in the open air, or if any other conditions appear that may keep up a nervous strain or lower the recuperative power and vigor of the patient, suggestions are given for their immediate correction.

PRELIMINARY STEPS IN TREATMENT.

Scaling. In beginning the treatment of any form of pyorrhea alveolaris, the first step is the removal of all heavy calcic deposits that are exposed on the crowns and roots of the teeth, thus cleansing the field and preparing for the

more difficult part of the treatment. This can usually be done at one or two sittings with the large hoe and hooked scalers.

Cleaning of pus pockets. If there are pus pockets, every one should be syringed out with warm hydrogen dioxid at each sitting, beginning with the first and continuing through the treatment until there is no pus remaining in any of the pockets and until they have closed up.

Mouth toilet. At the first sitting the patient is instructed to use the dioxid three or four times a day. If there are pus pockets, the gums should be pressed with the fingers to eject the pus, and the mouth washed well with dioxid before meals, to prevent the pus from being incorporated with the food and carried into the stomach. A good portion of the time during the first few sittings is spent in instructing the patient in the technique of oral hygiene, and as to why it is necessary that each item be carried out, thus enlisting the hearty cooperation of the patient in the treatment and in oral hygiene during and after the treatment. The failure to so interest the patient at the proper time is the cause of many failures in treatment, makes dissatisfied patients, and establishes a belief that pyorrhea alveolaris cannot be cured in any form or at any stage.

IMMEDIATE LOCAL TREATMENT.

These preliminaries having been disposed of, the immediate local treatment should begin.

Selection of instruments. Before proceeding to operate, all instruments likely to be needed are placed conveniently and in order to be easily reached by the operator. Care and judgment should be exercised in the selection of the proper instruments to most skilfully and thoroughly execute the work in hand. This requires experience, for there are numerous sets of pyorrhea instruments on the market; all are constructed with various curves to suit the idea and convenience of their originator, and all are more or less confusing to the beginner. These are constructed as push, pull, and side movement instruments. The push instruments have the chisel form, the pull instruments the hoe form, and those for the side movements have the long spoon shape. Some operators use one kind, while others use all. I have found it necessary to use some of each form.

If any of the alveolar process is to be removed, small discoid points, chisels, and smooth fissure burs should be used.

Anesthetics in treatment of pus pockets. The pockets to be operated on are syringed with warm hydrogen dioxid. If the pockets are shallow, an anesthetic is rubbed into the gums; if they are deep, a local anesthetic containing adrenalin chlorid is injected, as for extraction, around the teeth to be operated on at that sitting. The adrenalin prevents the excessive bleeding and gives a clear field for work. Some operators who treat this disease object to the injection of a local anesthetic on the ground that it consumes time and is unnecessary. This operation is a most painful one, in a field where anesthetics are usually effective, and as a first consideration, for the patient's sake an anesthetic should be used. As a second consideration, it allows the operator to proceed as rapidly as he can work, without the frequent if not constant protests of the patient, thereby enabling him to accomplish more in any fifteen to sixty minutes than could be done without the anesthetic. The tissue being anesthetized, the instrumentation is proceeded with as rapidly as is consistent with thorough, painstaking work, until all the deposits are removed from the roots, the roots scraped as smooth as possible over their entire denuded surfaces, the necrosed processes removed, and all jagged edges trimmed. It is a common mistake to leave deep pockets of long standing after cleansing the root without curetting all of the exposed surface of the process, which is always infected if not necrosed; therefore the surface is cut and freshened, and a clean surgical job made of each pocket.

Number of sittings, and teeth treated at one time. The number of teeth to be operated on at one sitting and the time

of each sitting must be considered and must be suited to the strength and convenience of the patient as well as of the operator. My rule for sittings for the surgical work is one hour, the number of teeth one to four. This rule is varied according to the conditions met in each case. The sittings are given from two to three days apart for operating, and twice a week for treatment, after all the teeth have been gone over.

Disinfection and dressing of pus pockets. Immediately after operating, at each sitting the pockets operated on are syringed with warm hydrogen dioxid and wiped out with a weak solution of phenol-sulfonic acid, or a solution of lactic acid, cresol, and chloretone. This is applied on cotton wound on the end of a thin, pointed piece of orange-wood soaked in water or oil, and bent so as to be flexible. In some stubborn cases it is necessary to make several applications of the acid solution, but I do not allow it to remain in contact with the tissue more than half a minute. It is then washed out with water, and the pocket packed with sodium bicarbonate. The gums are then dried and painted with a solution of iodin crystals, zinc iodid, and glycerin, and allowed to dry.

A slightly astringent antiseptic mouth-wash is prescribed to be used twice a day, the patient is dismissed, and given an appointment for two or three days later.

REMOVAL OF PULPS.

If there has been any great loss of pericementum and alveolar process and the teeth are very loose, as a rule the pulps are removed from such teeth and the roots filled. Particularly is this true when a splint or bridge work is to be used in connection with extreme cases. When the pulps are to be removed, this is done as early in the treatment as possible.

Gum massage. After all the operating has been completed and the subsequent soreness has subsided, the patient is advised to massage the gums thoroughly once a day, preferably just before retiring. This is done to stimulate a healthy circulation and to toughen the gum tissue.

Massage paste. As an adjuvant to the physical treatment, I prescribe a massage paste that is slowly but entirely soluble, and which I have found to be most satisfactory to the patient and to myself. The formula is as follows:

Zinc sulfate,	gr. viij
Fluid red gum,	ʒj
Bicarbonate soda,	
Oil eucalyptus,	āā ʒss
Chloretone, inhalent,	ʒj
Vaselin (Alva), q. s. ad	℥j. M.

Extractions. One of the most difficult questions to decide in connection with any advanced case of pyorrhea is what condition of a tooth renders it advisable or necessary to extract. There is no positive rule applicable in all cases to determine extraction or retention, because teeth that are badly affected may be treated in some mouths and rendered serviceable for a reasonable time for a specific purpose, while in other mouths, under other conditions, such a procedure would not be advisable. It is, however, safe to advise the extraction of all teeth or roots affected with pyorrhea that have lost their entire alveolar support, and of those with a pus-eaten apex which have also lost the membrane from one-half their circumference for the length of the root.

AMPUTATION OF ROOTS.

There are cases with a pus-eaten apex, or with heavy deposits on the apex that cannot be successfully removed, in which the end of the root may be amputated and the tooth be made to give good service, provided more than half of the circumferential membrane and alveolar support is left.

Frequently cases present that require the exercise of a judgment that can only be gained by years of study and experience in the treatment of this disease. Whatever the conditions may be, I do not consider it advisable to preserve badly affected teeth or roots about which there is any question as to their reasonable serviceability.

SPLINTS.

There is a condition of extreme looseness of the teeth, associated with ptyalogenic calcic pericementitis, in which several of the teeth may be banded or joined together with a splint of some form and held firm. I prefer a splint with long pins, sunk into the teeth with connections cast on the pins in one piece from a wax form, or cast separately and soldered together and then cemented on. With this form, if any tooth in the splint should cause trouble, the end of the root can be cut off and the tooth allowed to remain in place in the splint.

In connecting the six anterior teeth the splint is confined to the lingual surface, so that it does not show. When it is used on the bicuspids and molars, the occluding surface is ground enough to get sufficient strength, and a V-shaped notch is ground into the approximal space to act as a brace for the splint.

BRIDGE WORK.

When teeth have been lost or have to be extracted in the treatment of pyorrhea, leaving only a few teeth or roots that can be put in a healthy condition, some form of bridge work can nearly always be used. If the spans between abutments are not too long and the abutments not too weak, fixed bridge work can be used; but when the remaining attachment to the roots is weak or the span too long, or a distal abutment is missing, and when there has been great loss of tissue due to shrinkage, some form of removable bridge work will produce more permanent and satisfactory results. There are numerous ways of constructing removable bridge work, but I consider the system devised by Dr. H. T. Stewart of Greenville, Miss., which has been demonstrated at several Southern dental conventions, to be the most universally practical for extreme cases.

PARTIAL PLATES CONTRA-INDICATED.

I do not advocate the use of permanent partial plates of any form in pyorrheal cases when these plates are fitted closely about the necks of the remaining teeth, as rubber plates usually are—for the results are always disastrous to those teeth.

VIGILANCE IN CURED CASES.

When the pyorrhea has been cured, the mouth placed in a healthy condition again, and an ample masticating surface restored, the patient, when dismissed, must be assured that the price of a continued healthy condition is eternal vigilance and care on his part, together with frequent visits to the operator so that the mouth may be carefully watched.

BETTER TRAINING IN THE TREATMENT OF PYORRHEA NEEDED.

A word about the training of the profession in treating this disease would not be out of place. My observation has been that exceedingly few dentists attempt to treat pyorrhea. There is a woful lack of confidence on the part of the young graduate, even from our best colleges, to undertake such treatment, giving strong evidence of a lack of sufficient and proper training of these young men in the treatment of this dread disease from which the public is suffering and which is continually presented to every dentist. This disease is destroying more teeth in persons of between thirty and fifty years of age than caries, and yet how few dentists pretend to even give relief, and how many more are constantly proclaiming that this disease cannot be cured, and that nothing is left but extraction and plates.

It is time for the profession to wake up and meet the demands of the public that is clamoring for the treatment of this disease.

THE PRACTICAL TREATMENT OF TRUE PYORRHEA ALVEOLARIS.*

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(Read before the First District Dental Society of the State of New York, at its regular monthly meeting, January 11, 1910.)

THE dental profession—like all professions, I presume—finds itself continually confronted with complicated problems which demand solution. As soon as one question is settled, others equally complicated present themselves. Thus those who believe dentistry to consist of more than mere mechanics, important though this be, are kept constantly at work solving these knotty problems.

For years the profession has been endeavoring to ascertain the cause of that disease which, for want of a better term and following the customary usage, I shall call "pyorrhea alveolaris"; yet notwithstanding the fact that our best and brightest minds have been engaged in studying its pathology, our knowledge of it, to say the least, is in an unsettled state.

SCOPE OF THIS PAPER.

It is not my purpose tonight to discuss the pathology of pyorrhea alveolaris, but while I shall make no attempt to settle the much-mooted question as to whether the disease is of purely local origin or whether it is a local manifestation of some constitutional disease, I shall endeavor to express in definite terms my idea of how the disorder should be treated from the practical viewpoint. It is therefore to this phase of the subject that I desire to direct your attention. I want to say, however, at the very outset, that I realize that the best way to treat any disease is to ascertain the cause and try to prevent its development.

TRUE PYORRHEA ALVEOLARIS AND ITS SYMPTOMS.

It is my opinion that a mistake has been made by the profession generally in the past in grouping too many of the diseases of the gum and the pericemental and alveolar tissues under one heading—calling them all pyorrhea. When I speak of pyorrhea alveolaris in this paper I mean true pyorrhea, and exclude all of those perverted conditions of the gum which can be restored to normal by a thorough prophylactic treatment. In true pyorrhea alveolaris I am here going to include those aggravated cases which present to every practicing dentist, the treatment of which calls for more than the simple removal of the deposits from under the gum margin and the polishing of the tooth-surfaces, however thoroughly it may be done. In these cases, as a rule, there is no gingivitis, interstitial or otherwise; the gum, in fact, is rather anemic, having a tendency to recede from the necks of the affected teeth. The pericemental membrane is being rapidly destroyed; the alveolar process is resorbed—virtually is melting away; the pockets are deep and variously located around a single root of a tooth, and frequently between the roots of multi-rooted teeth. Pus is generally present and exudes from the pock-

* In writing this paper I have consulted freely the chapter on pyorrhea alveolaris in my own book, "Modern Dental Materia Medica, Pharmacology, and Therapeutics."—J. P. B.

ets upon pressure; hard deposits may or may not be present. There is a progressive loosening of the teeth, and unless the disease is checked they ultimately drop out.

THE DOUBTFUL ETIOLOGY OF PYORRHEA ALVEOLARIS.

The true cause of this kind of pyorrhea—if there be more than one kind—has never been satisfactorily determined. It may be a bacterium, but as yet no specific germ has been isolated and proved to be the exciting agent, though the presence of various pathogenic germs has been scientifically demonstrated, as is evidenced also clinically by the pus formation. The cause of this condition cannot be wholly neglect on the part of the patient, for the disease occurs at times in the mouths of patients who take unusually good care of their teeth. The neglect in far too many instances can rather be traced to the family dentist, who either failed to recognize and correct the disease in its incipiency, or on recognizing it informed the patient that nothing could be done, and advised extraction as the only means of effecting a cure. It is a blot on the fair escutcheon of dentistry that so many teeth have thus been neglected and ultimately lost because of this seeming indifference of dentists. There are two sides to this question, however, for on the other hand we find men who claim to be able to cure every tooth affected with pyorrhea, however badly, and this frequently results in as much discouragement to the conscientious dentist who refers his pyorrheal patients to the so-called pyorrhea specialists as it does to the patients themselves. There has been some slight excuse, therefore, for this seeming indifference.

THE PATIENT'S CO-OPERATION.

When cases of this kind present for treatment the first important consideration is to impress upon the mind of the patient the fact that in order to obtain satisfactory and permanent results, it will be necessary for you to have his hearty co-operation, and that he must follow your instructions closely. This is exceedingly important, for there is perhaps no operation which dentists are called upon to perform wherein the patients' confidence and especially their co-operation, are such vital factors, so far as permanent results are concerned, as in the treatment of the condition under consideration; and it is truly surprising what good results can be obtained by the conscientious and persistent efforts of both patient and dentist.

INDICATION FOR EXTRACTION BEFORE PYORRHEA TREATMENT.

Before undertaking the treatment of a case, then, a thorough examination should be made, and there should be a distinct understanding as to what may reasonably be expected. The discerning patient will quite naturally want to know if his case can be cured. The word "cure" here can have but a relative meaning, and an explanation should be made in regard to what a so-called cure includes. It should not mean, in my opinion, that the lost tissues, *i.e.* gum, pericemental and alveolar tissues, can be restored. It should mean, however, that the teeth which you undertake to treat can ultimately be made healthy, comfortable, and useful, so far as mastication is concerned; and any tooth which cannot be reasonably expected to be restored to this condition had better be considered a hopeless tooth and extracted at once. This is the time to extract the hopelessly affected teeth, not after they have been treated for six months or a year. Nothing is more discouraging to patients than to have to lose a tooth after extended treatment. It has a tendency to make them question your ability to save any of the affected teeth. The experienced dentist should know from the condition he finds whether or not it is best to save the tooth. In this connection I desire to state that there are many hopelessly affected teeth in the mouths of pyorrheal patients.

PROGNOSIS OF CURE.

While the presence of pus, which is constantly being mixed and swallowed with the saliva and food, causing digestive disturbances and perhaps slow toxic poisoning of the general system, is of greater importance as far as health is concerned than is the looseness of the teeth in the jaw, patients, as a rule, are more interested in the latter phase of the question, and are always anxious to know whether the now loosened teeth will tighten and become firm after the treatment. That depends entirely upon the case at hand and the mechanical treatment involved. In the past, too much dependence has been placed on drugs, and too often also it has been left to nature to tighten the loosened teeth, when that should not be expected, on account of the extensive loss of tissues. The conscientious dentist who makes extravagant statements in this respect will have much cause for regret, as well as give much disappointment to his patient. I desire to speak emphatically on this point, for herein often lies the greatest source of disappointment; yet I dare say that each of you has been surprised, at times, how loosened pyorrheal teeth will tighten in the jaw under proper treatment without mechanical assistance other than the correction of the occlusion; but nevertheless, not too much should be promised in this respect. Unless the end of the root is resorbed, leaving it roughened, the pus formation can be checked and the gum can be made to resume a healthy appearance, but many times the teeth, without a permanent mechanical aid, will not materially tighten, though otherwise they are perfectly healthy and comfortable. The usefulness of such teeth, of course, is impaired by their looseness.

It is therefore important that this be properly understood at the beginning, for it prevents disappointment, it stimulates confidence in the operator's ability to treat the case, and it evidences the conscientiousness with which he works.

No dentist should undertake the treatment of a case of true pyorrhea unless he thoroughly understands the case and its requirements, and is equipped to render the best possible service, considering always the personal equation, and then only with the understanding that both he and the patient are to work in harmony, both exerting their best efforts to eradicate the disease. It is far better not to undertake the treatment of a case than to have it end in disappointment. This is not said with the idea of discouraging the general dental practitioner, but rather to stimulate all of us to do better work.

We now come to the practical treatment, which is threefold, surgical, medicinal, and mechanical, and each of these phases will be discussed here under its respective heading.

SURGICAL TREATMENT.

Instruments used. The surgical treatment includes the scaling of the teeth and the curetment of such parts as is necessary. To do this it is essential that we use such instruments as will accomplish our end in a definite and certain manner. The instruments which I use are the Logan-Buckley set. By the use of this set of twenty-five instruments, so devised as to reach all surfaces of the tooth-structure, the scaling can be done in a thorough and systematic manner, and with a minimum amount of injury to the soft tissues. If deposits are present they must be removed, and if absent, the pockets, including the affected tooth-surface and alveolar process, must be thoroughly curetted.

Antiseptic preparation of the mouth. Before beginning the scaling and curetting process, the mouth should be sprayed or rinsed with a warm antiseptic solution. I use for this purpose cinnamon water, to which about 2 per cent. of alcohol is added. This is a pleasant and agreeable solution. A glassful should always be in a convenient place, so that it may be used frequently with a strong water syringe to clear the field of operation. It is well to color the solution pink or red with tincture of cudbear, as this prevents the patient from seeing the

blood which may follow the operation; although in this class of cases, if the proper instruments are used, there is little necessity of causing much hemorrhage.

Procedure of scaling. The scaling should be begun on some particular tooth in the mouth, and this tooth should not be left until it is thoroughly scaled. This can only be done by following some definite system. I begin with instrument No. 1 of the Logan-Buckley set on the mesio-buccal surface of the upper right third molar, and with the six instruments (Nos. 1 to 6 inclusive) designed for this purpose one can work completely around the tooth in a methodical manner. If at any point a pocket is found too deep to be reached with these instruments, the counterpart of each, differing only by a narrower point and the exaggeration in form, is found in Nos. 16 to 21 inclusive. For example, No. 16 is the exaggerated form of No. 1, and so on throughout the entire six instruments. For the lower teeth the positions are exactly reversed. With one or the other of these groups of six instruments the molars and bicuspids can be scaled, except occasionally where deep pockets are found between the roots of molars and on the lingual surfaces of divergent lingual roots of upper molars. For these exceptional cases Nos. 9 and 10 are designed for right and left use, and are employed for scaling and curetting between the roots of molars, and Nos. 24 and 25 for right and left use on the lingual surface of divergent lingual roots of upper molars. No. 23 is for the distal surface of posterior teeth. In scaling the anterior teeth No. 7 is designed for the lingual and No. 8 for the labial surface. In cases where there is a deep lingual pocket which cannot be reached with No. 7, No. 22, the exaggerated form, can be used. No. 11 is a push instrument used in removing deposit from between crowded and irregular teeth. No. 15 is a general hook used for removing bulky deposit, wherever found, before the more delicate instruments are used. Nos. 12, 13, and 14 are prophylactic instruments which can be used with either a push or pull movement, and will be found useful in removing superficial decay and in polishing rough surfaces.

I have thus briefly described the use of the Logan-Buckley set of scalers, for while the system is not complicated, nevertheless it is essential that the operator should know exactly where each instrument should be used, so that the work may progress in a definite manner.

Sterilization of scaling instruments. After an instrument has been used, its point at least should be immersed in an antiseptic solution during the entire time the scaling is being done. To accomplish this, it is necessary to have a tray designed in such a manner as to hold the instruments in their proper place. It is a principle in surgery to avoid the presence of germs rather than to endeavor to kill them by the use of strong disinfectants during the operation. The instruments, therefore, should be sterile before they are used, thus avoiding the necessity for using strong disinfectant solutions in the tray. Such solutions would either act upon the metal, or would taste badly when the instrument is placed in the patient's mouth; for the proper instrument should be taken directly from the rack of the tray and used in the mouth. Therefore all that is necessary is to have a pleasant antiseptic solution in the tray. I use a 20 per cent. solution of phenol compound in glycerin, and of this about 10 minims is added to about one-half pint of sterile water, which is poured in the tray. This solution also may be colored with tincture of cudbear.

Duration of scaling operation and prophylactic treatment. The scaling operation should generally be limited in time to one hour, and the scaling process should be stopped in sufficient time to permit a thorough prophylactic treatment with orange-wood, pumice, and tape, according to the method of D. D. Smith, before applying the medicinal treatment.

Indications for extirpation of pulps. The question of removing the pulps from the badly affected teeth is an important

one, and should not be overlooked. There are at least three indications for the removal of the pulp in these cases, viz, first, where the pockets are deep and the infection in the apical area has so lowered the vitality of the pulp that ultimate death is the inevitable result; second, where the unnatural exposure of tooth-surface results in hypersensitiveness to the degree of constantly annoying the patient, and third, where the adjustment of a permanent retaining appliance is necessary.

It has been clinically observed that the removal of the pulp from a badly affected pyorrheal tooth is followed by a more rapid response to the local treatment of the disease, and many have advanced the theory that this result is produced by directing the entire circulation of the tooth to the sluggish pericemental membrane. On other occasions I have expressed a similar opinion myself, but the idea is erroneous. Noyes, Broomell, and others have shown that the pericemental membrane normally is well supplied with bloodvessels, and therefore extirpation of the pulp would not materially affect the circulation to this membrane.

Amputation of roots. Frequently we find cases where a single root of a multirooted tooth is practically denuded of its pericemental attachment, the remaining roots being in fairly good condition. The affected root in these cases should be completely excised. This of course necessitates the removal first of the pulp and filling the root. If two roots are thus affected, the tooth had better be extracted.

Local anesthesia contra-indicated. In connection with this surgical treatment I should mention the use of local anesthetics, for it is the practice of many dentists to anesthetize the parts operated upon. I would not advise the use of local anesthetic agents, for a further poisoning of the tissues by actual injection, when they are already in a low state of vitality, is contra-indicated, and the slight anesthesia otherwise induced is too often obtained only at the expense of nearly as much pain as the careful scaling and curetting with the proper instruments will produce. The tissues, not being anesthetized, serve as a guide for the careful operator in locating and following the pockets to the end, when the surgical treatment can be accomplished with a minimum amount of injury to the soft parts involved.

MEDICAL TREATMENT.

An astringent remedy. When the surgical treatment is completed—and the teeth operated upon have been thoroughly polished, the mouth should again be sprayed with a warm antiseptic solution, forcing it between the teeth and under the gum margin in order to mechanically remove any loose deposits or pumice which may have been left from the polishing. The parts should then be kept dry by the use of Japanese bibulous paper or cottonoid rolls, and an application of some astringent remedy should be made. For this purpose I use the following:

℞—Potassii iodidi,	ʒij
Iodi (crys.),	ʒijss
Zinci phenol-sulfonatis,	ʒij
Aquæ,	fʒvj
Glycerini,	fʒiijss. M.

Sig.—Apply freely to the gums.

The patient's duty of brushing and massaging his teeth and gums. After this remedy has been applied for a moment, the mouth should again be sprayed or rinsed. The patient should be instructed to properly brush, massage, and care for his mouth and teeth generally. Prescriptions should then be written for an antiseptic mouth-wash and tooth-powder or paste, and the patient be dismissed until the next setting. In instructing the patient relative to brushing the teeth, it should be emphasized that the gums should be vigorously brushed as well as the teeth, thus securing the benefit of the massage. It should be remembered here that both patient and dentist are confronted with a serious problem, and therefore the instructions should be explicit, and the progress of the case be watched closely.

Iodin is a penetrating and stimulating

agent, and is especially efficacious in these bone affections. If the surgical treatment has been thorough, the case generally yields nicely. The astringent remedy may be applied at first every two or three days. The intervals for the subsequent applications should gradually be lengthened, and in about two or three weeks the case should be ready for the patient's own care.

Cauterization with phenol-sulfonic acid in stubborn cases. It is occasionally necessary in a stubborn pus pocket to resort to stronger remedies and to thoroughly cauterize the area involved. For this purpose I use a 25 or 50 per cent. solution of phenol-sulfonic acid. I have recently succeeded in having this agent prepared in such a manner that practically all of the phenol and sulfuric acid used in the manufacture of phenol-sulfonic acid is in a combined state. This makes a very efficacious remedy. As a rule the use of acids in the treatment of pyorrhea alveolaris is contra-indicated because of the extreme hypersensitivity which they produce.

Amputation of root-apices or extraction in persistent cases. When after the above treatment the pus still persists, we can suspect resorption of the root in the apical area, leaving sharp, needle-like points, which prevent healing. In this case it is necessary to excise the root-end or extract the tooth. When the root is completely or partly excised, the cavity thus formed may be filled with Beck's cerate of bismuth subnitrate. This stimulates the affected part and prevents reinfection from the oral cavity.

Replantation. Some writers advocate replantation in these cases, but my experience in this has not been satisfactory. For permanent results it is absolutely necessary that the replanted tooth be held firmly in position by some retaining appliance, and it has been my experience generally that extraction and the insertion of an artificial substitute is far more sanitary and satisfactory. It is not a question here of what a dentist can do by his ingenuity and skill, but rather of what is best for the patient.

Systemic treatment. There are surely cases of true pyorrhea alveolaris where the local condition in the mouth seems to be aggravated, if not caused, by some systemic disease. It is the plain duty of the dentist here to collaborate with the family physician. In fact, when we are certain of our diagnosis of systemic disturbances, it is almost useless to undertake the local treatment unless measures are simultaneously instituted for the correction of the systemic disease.

Mouth-washes and tooth-pastes. The general prescribing of mouth-washes which contain astringent drugs, especially the zinc salts, in the treatment of pyorrhea alveolaris, in my opinion is wrong. Certain tissues of the mouth need to be constringed and stimulated to healthy activity, but the entire mucous membrane surely does not need to be so treated. In a series of experiments on dogs, Cook has shown that the continuous use of astringent mouth-washes interferes for hours with the action of the ptyalin upon starchy foods. The astringent remedy should be applied by the dentist only to those parts that are in need of such treatment, and an antiseptic mouth-wash, together with a proper brush, tooth-powder, or paste, and other utensils for mouth toilet, is all the patient should use. A prescription for a tooth-paste is here given:

℞—Calcii carbonatis ppt., ℥iijss
Saponis, ℥ss
Sodii benzoatis, ʒj
Eucalyptolis,
Olei menthæ pip., āā ♏x
Thymolis, gr. iv
Saccharini, gr. iij
Glycerini, q.s. ad pasta. M.

Sig.—Use as a tooth-paste.

Any known antiseptic solution may be prescribed. It is as unnecessary as it is unwise for the dentist to prescribe the "cure-all" mouth-washes or those the constituents of which are to him unknown. The official mouth-wash may be prescribed, and diluted to suit the case, a prescription for which follows:

℞—Liquoris antiseptici, f℥viij.

Sig.—Dilute with one-half warm water and use as an antiseptic mouth-wash.

While it is unnecessary to remember the formula for this antiseptic solution, it is well to remember that it contains about 2 per cent. of boric acid, 0.1 per cent. of benzoic acid and thymol, 25 per cent. of alcohol, and other aromatics and antiseptics added to water as a vehicle. This prescription illustrates the value of a working knowledge of the pharmacopeia.

In those cases complicated by indigestion and where the patient complains of a sour taste in the mouth, especially upon rising in the morning, due either to local fermentation or to the regurgitation of acid from the stomach, the condition may be corrected by the following prescription:

℞—Sodii bicarbonatis, ʒj
Infusi gentianæ comp., fʒiij. M.

Sig.—Take a tablespoonful before meals and on retiring.

When the sour taste comes purely from local fermentation, all that is necessary is to use a warm solution of sodium bicarbonate, or the following alkaline and antiseptic mouth-wash may be prescribed:

℞—Sodii bicarbonatis,
Sodii boratis, āā ʒss
Thymolis,
Mentholis, āā gr. ss
Alcoholis, fʒijss
Glycerini, ɪ̄ʒij
Aquæ cinnamom., q.s. ad fʒviij. M.

Sig.—Use as an alkaline and antiseptic mouth-wash.

It will be found that either the above solution or the warm sodium bicarbonate solution will correct that transitory sensitiveness which frequently follows the usual treatment. In my own practice I moisten the pumice for polishing with this alkaline and antiseptic solution.

MECHANICAL TREATMENT.

The importance of permanently retaining loosened pyorrheal teeth in the mouth by mechanical appliances has elsewhere been emphasized. This phase of the treatment, though important, will not be discussed in this paper. The proper appliance will naturally suggest itself to the ingenious dentist. Such appliances consist in a combination of inlays, crowns and bridges, splints, and various retainers.

FINAL PLEA.

For the last few years the greater part of my practice has consisted in treating pyorrheal patients, and I find much satisfaction in working for them. In many instances they have been informed that nothing could be done, and that they must soon lose their teeth; therefore in most cases they appreciate every effort.

There is in this country a pure food and drugs law which is accomplishing much good, but for my part I would prefer to have my food not quite so pure and my mouth clean rather than to have my food absolutely pure and have it mixed with such oral filth and bacteria as we so frequently see in the mouths of some patients. Let us all join hands, then, in enforcing the unwritten law of keeping the mouth clean and wholesome.

If this paper may be the means of stimulating a greater interest on the part of the general practitioner of dentistry to take up in greater earnest the treatment of true pyorrhea alveolaris, I shall feel well repaid for my effort;—for anyone who treats this disease in its worst stages cannot but recognize it in its incipiency in other mouths, and will therefore see that measures are instituted to prevent its development.

THE PRACTICAL APPLICATION OF ORAL HYGIENE TO THE SCHOOL CURRICULUM.

By PAUL G. WHITE, D.M.D., Boston, Mass.

(Read before the New York Odontological Society, at its regular monthly meeting, January 18, 1910.)

SUPPOSE that in a healthy village a strange plant should suddenly spring up and give off poisonous matter into the air, making all who passed by it ill because of the gas from its deadly fumes. Would the people allow it to ripen its seeds and scatter them abroad, or would they cut it down and destroy it? Suppose a poisonous serpent should appear and attack the people. Would they allow it to live and multiply? No! They would certainly destroy both plant and serpent, for no one would wish to suffer illness or death because of them. But in all the world there is not a community where there are not small animals and plants termed disease germs, which cause many of the worst diseases that affect mankind, and are really the greatest enemies of the human race.

Under our constitution the governor, in case of an insurrection of such proportions as to successfully defy the powers of the state, can call upon the President of the United States to send to his aid the thoroughly trained troops of the regular army. Our business is that of war—war against a foe so numerous and so armed with the agencies of disease and death as to make an army with banners pale into insignificance. Indeed, if we could see the waving of the banners and hear the roll of the drums, and the shouting of the captains, there would be no difficulty in securing men and treasure to defend our firesides. It is because the enemy we have to fight is so still, so secret, and to the uneducated mind so mysterious, that it is extremely difficult, as we all know, to get the people to realize the danger; and just here, in this lack of faith—through ignorance—we encounter the fundamental difficulty in the administration of hygienic laws. But in great epidemics the evidence is so plain that the people wake up and are ready to call for help from any source, and while they can receive advice, they can receive no assistance from our public health and marine hospital service other than interstate quarantine, as no provision is made for the expenditure of money in this work, beyond the salaries of its officers.

That this bureau should be strengthened, its powers and duties enlarged especially for the functions of research and education, is the opinion of us all. The federal government cannot regulate education, yet it endeavors to foster education, and maintains a bureau for that very purpose. It cannot regulate agriculture or labor, yet its related bureaus have long been recognized as an essential part of the government machinery; and what the government has done and is doing for education, labor, and agriculture it can and must do for public health. It might, perhaps, as has been suggested, receive an appropriation equal to that so wisely expended by the department of agriculture. There is a sharp line, however, between advice and control. Sanitary control must, from the magnitude and variety of the problem, be a local matter.

Authority to make and enforce laws for the protection of the public health is part of the police powers of every government. It does not depend upon any

express grant, but is an incident to government itself. It was inherent in each of the thirteen sovereign states when they, by the delegation of certain of their powers, created that part of the government, in contradistinction from that other part known as our state governments.

As the police power was not among the powers thus delegated, the right to make and enforce laws for the protection of public health still resides in the state governments and is not vested in the government of the United States, except so far as those parts of our country are concerned that are not under state control. It follows, then, that no federal public health service can displace the states' services, or in any way limit their jurisdiction, and therefore it follows further that no federal public health service can be in any large degree successful unless it lends itself to the upbuilding of states' services where upbuilding is necessary, and to the bringing about of co-operation among the services of the states themselves, and between them and the federal service, or unless it wins their support, respect, and sympathy.

Both the educational and the medical professions now agree that our public-school pupils should be adequately instructed in the methods and possibilities of preventive medicine and in the principles and reasonableness of public hygiene. The most effective way of reaching the present generation of Americans is through their children, and our country can hope to shake off completely the burden of preventable disease only when a generation of American citizens has been systematically instructed in the principles of hygiene and sanitation.

If it is true that the public schools have served as an incubator for the developing and the disseminating of more disease than any single cause known, to compel a child to attend school and to subject it to infection that may result in sickness or death, if such conditions are known to exist by those in authority, is surely nothing short of an unjustifiable crime.

If medical inspection has been inaugurated to prevent the spread of disease among children attending the schools, then it seems that such prevention of disease ought not to be wholly confined to the prevention of infectious disease only. Let such inspections go a little farther. Let the medical inspectors remove the predisposing causes of the maladies that children are prone to contract at school, for then only will a perfect condition exist. The pure food agitation, for example, must find its main justification on economic and moral rather than hygienic or sanitary grounds; for of what use is pure and wholesome food if the mouths of our people are in such neglected conditions that the air which passes through them is polluted, and every mouthful of food swallowed carries with it, not health-giving pure food, but poisons to be absorbed and passed on to the remotest tissues. All this leads us to the one essential thing—that which itself is the very basis of life—*nutrition*. The greatest living exponent of dietetic righteousness, Horace Fletcher, says, "The whole problem of nutrition will be settled within the first three inches of the alimentary canal," and hardly anyone would doubt the truth of that remark. If this is an acknowledged truth, then who but the dentist is the keeper of the "gateway of life," and still more the "gateway of health," for life is not worth living without health. Is it not, then, possible to say that a proper knowledge of oral hygiene and Fletcherism is the very basis of personal, domestic, and municipal hygiene, and that although general hygiene can be taught without teaching or acquiring oral hygiene, oral hygiene cannot be taught or acquired without the formation of habits of general hygiene?

We are repeatedly told that the remedy is education—the education of the public and the education of our school children; but the question is: "How and when is this to be brought about?" It is surely not a lack of knowledge, but a lack of application of this knowledge, which is at fault.

It is not possible for an individual to protect himself from disease if those about him are carelessly scattering germs

abroad. Only someone with authority over all the people can guard the health of a community, and public health officials are absolutely necessary, if sanitary measures are to be enforced.

Parents continually object to the physical examination of their children in school, but as no thief thinks well of the policeman who arrests him, and no murderer loves the judge who sentences him to be hanged, so the persons who are compelled to clean their premises and persons and live so that they will not be a nuisance and a source of danger to their neighbors, try to injure health officials and hinder their work.

Many persons agree that public sanitation and instruction is a good thing, but think that the town or state in which they live cannot afford it. Those persons do not understand how much preventable diseases are costing their communities, nor do they understand political economy.

Bearing these facts in mind, let us consider the subject of my paper, "The Practical Application of Oral Hygiene to the School Curriculum." This subject is so large and vast that one individual can know but very little about it.

Educators claim the educational period, as far as school children are concerned, to extend from the fifth to the fifteenth year, and that it is during this period that the future efficiency of the body is decided for good or bad. "As the twig is bent so is the tree inclined," and this is as true of the body as it is of the mind. Whether our work be done by examination, lectures, text-books, or conjointly, it is to this educational period, as far as the schools are concerned, that our attention should be given.

Many state laws now call for the medical inspection of school children, for the detection of any disability or defect tending to prevent their receiving the full benefits of their school course, and for prevention of the spreading of disease from one to another. They also require a record of all children to be kept in such a manner as the state board of education shall require. These inspections are considered to be best conducted under the supervision of the school authorities, for friction is liable to occur if the health department exercises authority over pupils during the school session and in school buildings; and as health boards have unlimited supervision over all persons who are affected with any communicable disease, and who are located in their own homes, it is undoubtedly advisable that school boards should be held responsible for the care and safety of pupils while in the school buildings. Moreover, the compensation for medical inspection is properly paid from school funds, and the regulations under which the work is conducted must be adjusted to produce a minimum of interference with the ordinary routine of instruction.

Section 5 of the Massachusetts inspection law lays special stress upon defective sight and hearing, and, if the teeth were at all considered, they must come under the words "any other disability or defect." To the question, Does medical inspection in Massachusetts include the examination of the teeth? one might answer both Yes and No.

Since the recent agitation in Boston, the medical inspectors examine each child's teeth, but no systematic record is taken and filed away. The child needing attention is then told to go to the dentist, and if the school nurse happens to become interested, perhaps she takes the children who are unable to consult a dentist to one of the public dental clinics now established in the city, or to the college clinics. The physical director of the Boston schools considers the school physicians fully competent to undertake these examinations, and in the absence of a regular free public-school dental clinic, of just as much benefit to the pupils as when made by the dentist. In other words, it becomes a case of "We will make the diagnosis and send them to you for repair," and we dentists become simply tooth carpenters in the eyes of the medical profession.

Dentistry is really and truly a branch of the medical profession, and although recognized as such by the American Medical Association, is it given the same consideration in the eyes of the lawmakers?

Will the Massachusetts medical inspection law have to be amended, or shall we also have a dental inspection law? or will dental inspection be made a part of medical inspection?—these are the questions we are now trying to decide.

Many of our most enthusiastic workers have become almost discouraged in regard to examinations. "Of what use are they," they exclaim, "if we have no means of relieving the conditions found?" They say, "We have statistics enough, they are a waste of time and energy. Why should our city or town differ from others to any great degree?"

To all these questions we can only answer that in all the leading countries of the world a record is kept of all deaths and of the diseases that cause them. How are we to find out whether or not caries, etc., is more common in a town than it should be? How are we to tell which diseases are most important in our communities, if not by keeping and comparing these records? Our most important object, then, would be:

(1) To show the general public conditions as they actually exist.

(2) To secure data which will cause the state to establish and maintain such inspection and care as will secure the best possible working efficiency in our schools.

(3) To show that by proper instruction and care of the mouth from 50 to 75 per cent. of the ills among school children will be eliminated.

(4) That with the mouth and teeth in perfect condition and the food properly cared for while in the mouth, the working efficiency of each pupil will be increased from 50 to a much higher per cent.

(5) To show by a comparison of the data gained in schools where this examination and instruction is given, and in those where it is not, that the former are in better condition mentally, morally, and physically than the latter, and to solicit the support of the public in checking and stamping out a condition which is fast undermining the life and health of the nation, a condition which, even if the dental profession were doubled and trebled many times, could not be entirely overcome, owing to lack of practitioners.

The first thing to do is to get permission or legislation for such inspection; the methods to be used will be an after consideration. The city of Cleveland, through its Cleveland Dental Society, and the town of Brookline, Mass., furnish excellent examples of practical examinations.

If the most serious defect in medical inspection is the paying of small salaries to the physicians for doing patchwork, when we know that specialization in work of this character is no longer merely advisable but imperative, then the same condition applies with equal if not more force to dental examinations.

To take a child's mouth and put it in a healthy condition is considered ill-advised charity if the child has no habits of dental cleanliness, and many workers claim that lectures do far more good. The question comes up now and again, Are cities and towns, as a general rule, in a position financially to undertake the proper care of school children's teeth, and even if they are, is this the best way out of the difficulty?

Perhaps we had best leave that question open for discussion and consider the two remaining methods of instruction. The many advocates of lecture courses are gaining ground, simply because outside of examinations this is the next best practical way of distributing this knowledge. Such a course, if conducted in the right way—that is, after the manner of the musical instructors, who visit the schools once a month—would prove of immense value if the children were compelled to take notes, and a final examination were given on this subject. Such a course, however, would require a great deal of one or several lecturers' time, and would necessarily call for a salary to be paid by the school board, which the school board at present is not as a rule willing to pay. Then, again, the way for controversy would be opened, furnishing a precedent for others aiming at the establishment of a healthy physical condition of the other organs.

We all know that the laws of every

state require that hygiene be taught a certain number of hours each week, and that for failure to do so teachers may be arrested, fined, and removed from office. We also know that the general opinion of the medical profession is that hygiene, as taught in the schools, is a sinister practical joke. The cursory and indifferent attention paid to hygiene can be evidenced by any school curriculum. The garbled and inferior text-books are devoted largely to the effects of alcohol and tobacco on the human system, with a calm and magnificent disregard for the urgent problems which enter our daily life, such as the prevention of the predisposing causes of disease. We also know that not one text-book on physiology or hygiene is used in our schools today that contains a worthy chapter on oral hygiene. Perhaps this is our fault, perhaps it is not, for who but the dentist should write such a chapter? It is true that many books have been written for the education of the public that do not get outside the dental profession, simply because there is no demand, but do you know of one of these books that would be a practical text-book for public school use?

We go before school boards and school superintendents and plead for the introduction of oral hygiene. For some reason or other examinations are rendered impossible, lectures in some places are impracticable on account of local jealousy and animosity. When asked what text-books we would recommend, we have to confess that we have none. "What!" says the school board and "What!" says the superintendent. "Is it possible that a subject on which you place so much importance is not worthy of a text-book. If that is the case, is it worth introducing into the schools?"

I have heard a great many men say that if we did have text-books it would be difficult to introduce them into the schools; and did we succeed, they would probably remain in some dark garret or dusty corner in the book-room until out of date. While it is true that no text-book is so much neglected as are the books on hygiene, perhaps it is equally true that the child is just as well off without some of them. But there still remains the fact that, if we had text-books in the schools and they were neglected—if we had an active National Dental Association, things could be so stirred up that the laws compelling hygiene in the several states would be enforced with vigor. If the National Dental Association would publish a chapter on oral hygiene, compiled and copyrighted by it, I know positively that the majority of the authors of the various text-books on physiology and hygiene now used in the schools would be glad to have it incorporated in their books. The thing to do is to get the book. Let there be more than one, as there is more than one on hygiene and physiology, and let the schools choose from the number. At any rate, let us do all we can to sweep our present farce out of the schools, and consign it to the junk-heap, where it belongs.

As a member of the Oral Hygiene Committee of the National Dental Association, I feel it my duty to tell you of our plan for the ensuing year.

We wish the president of every state society in the Union to appoint a committee on oral hygiene, to work in connection with the National committee, and to have, through them, every subordinate or independent organization in the states elect or appoint committees to work in connection with us. If this can be done, we shall have every organization that is working on oral hygiene report to us directly upon what they are accomplishing, and when anything new that is worthy of consideration comes from any source whatever, it will be compiled, along with other good points, printed, and mailed to the other committees at work throughout the country, as well as to school boards, chambers of commerce, boards of health, charity institutions, and every other organization which may be brought into play to advance the interests of this work.

This will give us the benefit of the best minds throughout the entire country, and will send a wave over the land which will do far more good in one year than

could be accomplished in years by each organization working separately.

Such a system, if successfully inaugurated throughout the length and breadth of our continent, would, I am confident, soon make itself evident in a noticeable narrowing of the broad swath annually cut through the columns of our school children by malnutrition and disease.

THE ADVENT OF PAINLESS DENTISTRY.

By BENJAMIN H. MASSELINK, D.D.S., L.D.S., Cape Town, South Africa.

HARDLY commensurate with the progress made in recent years in scientific and artistic dentistry has been that of what may properly be termed humanitarian dentistry. The trying ordeals incident to malleting or burnishing a large foil filling have given way to the pleasure of inserting a finely contoured inlay. The art of restoring tooth-structure where gold or alloy would prove "artless" has been mastered by the porcelain inlay and the use of the silicate cements. Crown and bridge work has been simplified and improved. We have, indeed, reached an ideal point in dentistry, but for one cruel and hitherto uncompromising demon—pain. We all are aware of the extreme horror with which most of our patients view our dental engines. This indispensable piece of office furniture has no friends; it worries and wears out the operator through its worrying effect upon the patient. No matter how accustomed we get to the tears of our smaller folks and the wailings of the older ones, we never feel a thrill of joy in our bosoms on such occasions.

This is not because no attempts have been made to alleviate the pain. Most of us have tested the high-pressure syringe, but one must use it on good tooth structure, often necessitating the drilling of a hole where he does not want it. This, coupled with its manifest dangers to the pulp, has caused the majority to discard it.

Cataphoresis often consumes as much time as to an illiterate the word might indicate.

The ethyl-chlorid spray has been used with great success, but the time consumed in adjusting the necessary appliances, the difficulty of preparing cavities under the spray, and the not improbable danger to the pulp cause us to look for something better.

Not that the above-mentioned methods are entirely useless—even cataphoresis has its very effective side, and in the hands of some is of great value—but none are practical enough to attract the majority of busy dental surgeons.

While correcting this paper, the March number of the COSMOS comes to hand, with an excellent article by Dr. Gregg. The expense incurred in the use of nitrous oxid and oxygen, and the absolute necessity of having an assistant to aid in its administration, letting alone the difficulty often encountered in the administration of an anesthetic, to patients who need it most, supply sufficient reason why not more than twenty-five per cent. of dentists can avail themselves of its use.

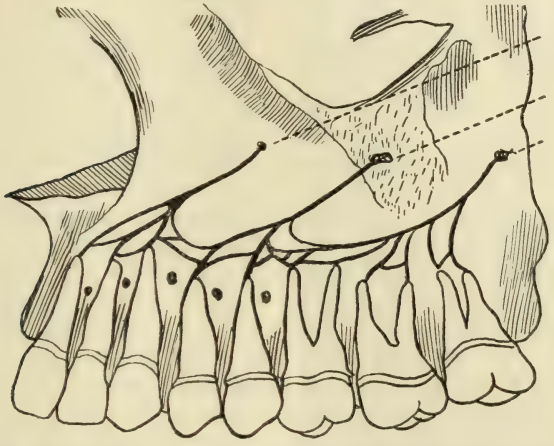
THE METHOD RECOMMENDED.

I invite you to the consideration of the following simple and inexpensive method. This method is not entirely in its experimental stage. In England, where it found its impetus, scores of dental surgeons are using it constantly.

By referring to the accompanying diagrams (Figs. 1 and 2) the reader will be

able to better comprehend the method. The diagram may refresh the memory as to the anatomy of the parts involved, for those who have forgotten where

Fig. 1.

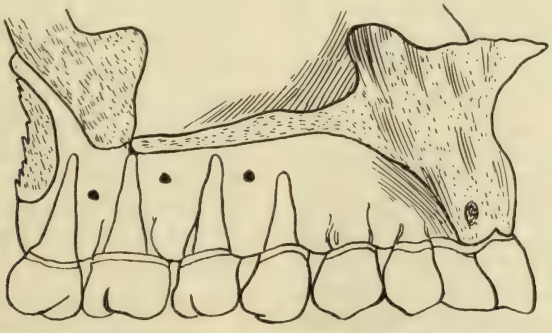


Dots show places of injection on labial and buccal side.

old Gray was stored during graduation week. It will be seen that in the maxilla the posterior, middle, and anterior dental nerves form a plexus in a line drawn along the apices of the roots; that the teeth are supplied from this plexus as well as from the main nerves. In the mandible the teeth are supplied by the inferior dental, as here the supply is more direct from the main nerve.

The alveolar process consists of an outer and inner plate, with spongy bone or diploë intervening. The nerves with their branches ramify through this loose structure *en route* to the apices of the teeth. If a local anesthetic can be brought into contact with the nerves before they enter the apex of the tooth, such a nerve will be anesthetized and the tooth, so to speak, desensitized.

Fig. 2.



Dots show places of injection on lingual side.

The operation for accomplishing the desired end is so simple and so entirely devoid of all subsequent dangers to tooth or patient that many interested readers will perhaps hesitate before attempting it. It need occupy only three or four

minutes, and all may be done entirely without pain, as follows:

A pledget of cotton soaked in a saturated solution of cocain and adrenalin is applied to the mucous membrane in the depression between the roots of the teeth to be operated upon, and as near the apices as convenient. In a few moments the membrane will be sufficiently cocainized to insure the insertion of a hypodermic needle without pain. A drop of local anesthetic is now injected beneath the mucous membrane. This completely anesthetizes the region in an instant. A No. ½ round bur is now employed in drilling a hole through the outer plate of the alveolus. The sense of touch will guide one in this, for when the bur has penetrated the plate it will suddenly ease itself. An ordinary hypodermic syringe is now employed in injecting a local anesthetic into the diploë. This, in short, is the whole operation. It is absolutely necessary that it should be performed as aseptically as is practical, and for this reason the following precautions are taken: A small cotton roll is placed high up under the lip where this is possible. The region is bathed with a weak solution of mercury bichlorid and carefully dried. The bur used should be sterile, and for this reason is always kept in an antiseptic solution, and before being used is dipped in pure carbolic acid and then in pure vaselin, the former to render it aseptic after handling, the latter to facilitate the penetration of the soft membrane.

An extra syringe for injecting into the diploë other than the ordinary one is necessary. The needle-point of this syringe should be cut off to within about a sixteenth of an inch from the shank and left dull. This syringe is likewise kept in an antiseptic solution. The short needle will sink into the hole up to the shank, the latter blocking the way to prevent the return of the solution.

For convenience and quick work a large glass jar about four inches deep with a large cork stopper is used. Two large holes are made through the stopper for the two syringes, and several smaller ones for the burs. The jar is filled with a ten to fifteen per cent. solution of formalin to which a handful of borax has been added, the latter preventing the rusting of needles and burs.

In drilling into the alveolus it is not necessary to be on a level with the apices. The dots on the accompanying figures indicate convenient and satisfactory places.

No hole should be drilled between the centrals, that spot being the line of union of the jaw. The roots of the central and lateral in the mandible are often too close together to insure safe drilling. In such a case the aperture should be made between the lateral and the canine, the directions of the roots indicating the best place for operating. Often two or three teeth can be desensitized with one injection. In the molar region the operation is more difficult at first, but after the operator has gained some experience these teeth also fall easy victims. The upper molars respond quickly if one operates on the lingual side with the right angle—so quickly, indeed, that one is awestruck at times, wondering as to its reality. This is particularly true of the third molar; the lower molars, especially the second and third, are hard to master, but an excellent way will suggest itself in time.

The solution employed must necessarily be of the least toxic variety. The diploë is very vascular, and absorption takes place immediately. Preparations containing cocain must be avoided. The author has tried several varieties of local anesthetics, all with equal effect upon the tooth but with unequal effect upon the patient. A solution prepared accordng to the accompanying formula and used as directed is perfectly safe and absolutely certain:

Take—Novocain,	1.000
Thymol,	0.033
Sodium chlorid,	0.450
Distilled water,	50.000

This solution should be put up at boiling temperature, and kept in a dark-colored bottle with a rubber stopper. Although normally stable it should be heated to boiling-point at least once a week. Heating does not affect the an-

esthetic properties of the solution. A small quantity sufficient for the day's use should be poured out into a small bottle, and to every fifteen drops one drop of adrenalin chlorid added. This preparation is now unstable and good only for that day.

A small quantity of the above solution carefully injected will produce local anesthesia lasting from fifteen to thirty minutes, without any noticeable toxic effects. It can be used in cases where cocain solutions in very small quantities would produce marked poisoning, with very little or no evil ensuing. I venture to say that nothing else should be used, unless it were a preparation less toxic even than the novocain.

The method is of great value in all cases where pain is a barrier to good work. In the preparation of cavities its merits need not be commented upon; thorough preparation becomes as simple as it is expedient. The preparation of vital teeth as abutments for bridges, where indicated, is "a joy."

In extirpation of pulps it has a special advantage through the action of adrenalin on the blood supply to the teeth. The bleeding is usually slight and easily controlled, affording excellent opportunities for immediate root-canal filling. The adrenalin chlorid constricts the vessels, thereby diminishing the blood supply to the teeth.

What about the after-effects?

With the novocain solution no sloughing has ever been noticed. The small wound inflicted upon the gums heals in a day or two, with slight or no inconvenience to the patient. A few patients reported a slight pain a few hours after the operation.. This subsequently passed off with no evil results, and its cause could not be ascertained.

The effects upon the pulp are, I believe, even less than under ordinary operations, for the tooth being temporarily deprived of a part of its blood supply—which it regains by degrees upon the absorption of the anesthetic—is free from the subsequent hyperemia that often follows the rapid excavating of cavities by burs.

As stated before, so far no toxic effects have been noticed from the use of novocain. In suspected idiosyncratic cases I should advise the dilution of the preparation by adding distilled water, or better, a normal salt solution.

I may here cite a few effects that are positively good, and first in importance is that upon the patient. The dread of having dental work done is abolished, and the patient returns with as little thought of pain as if he or she went to consult a physician. Instead of facing a succession of wailings each day, you often face a procession of children following a delighted mother, all to be examined and, of course, treated. Words fail in picturing the joy that patients express in various ways.

On the operator the effect varies with each individual. As for me, "Whereas formerly I loathed the preparation of cavities, now I love it." Instead of worrying about the sensitive cervical cavities, I now prefer them because of their easy access. To use the words of an English writer, "It is the nearest approach to heaven that a dentist gets"—temporarily, I trust he means!

Cases. I will refer to a few of the scores of cases worthy of special notice.

A man of forty-five or fifty years of age, a member of Parliament, came for an examination. Among other things a gold filling at the cervical margin of the lower left canine was found defective. The patient said that when this tooth was filled seven years ago the pain incident to the operation was so intense that he swore he would have it extracted if it should ever need further attention. After explaining the reason why this tooth should be saved, I asked for permission to give it a trial. Without telling the patient what I intended doing, the whole operation was gone through, the intra-alveolar injection being made between the canine and lateral. Within twenty minutes the cavity had been prepared for an inlay, and, incidentally, a distal cavity in the lateral and a mesial cavity in the central. His astonishment and appreciation were expressed in words worthy of his statesmanship.

A little girl of eleven presented with a dozen fillings of various materials, all of which after a year's service had given out.

The teeth were very sensitive, and this evidently accounted in part for the defective work. It was not until many repeated assurances were given that I would cause her no pain that the patient was coaxed into the much-dreaded dental chair. The sound of the engine caused her to shiver. Two cavities were prepared with no discomfort outside the buzz of the bur; later all the work was finished. A lost patient reclaimed!

A young lady who had been told that her extreme nervousness placed her beyond the scope of dental work called upon recommendation of her sister, who had experienced the "new delight." A pulp was extirpated in an upper second molar and several cavities prepared without a sound or stir.

There is no need to pile up cases. Painless work has a very commendable aspect in *every* case.

To sum up: This method is quick. After the initial trials and possible failures, it need take only three or four minutes. No extra charge need be made on this account.

It is easy. You need only to try it to be convinced.

It is cheap—the cost is *nil*.

It is practically universal, the lower molars only presenting difficulties, more particularly the second and third.

Lastly, it is safe—as experience has proved and I believe will never disprove, for we are going to improve.

USEFUL HINTS.

Apply the pledget of cotton, soaked in cocain solution, immediately, and let the lip drop over it, and it will stay in place, doing its part while you arrange the necessary instruments.

Locate the roots carefully, so as not to injure the pericemental membrane.

Do not use the same needle too often. It is apt to rust slightly and weaken at the junction of the point with the shank. It may then break and lodge in the aperture. The manufacturers should make a silver needle for this purpose, to insure against this accident.

Obtain a good contact of the shank of the needle with the opening into the alveolus before the injection, so as to prevent waste of the solution and to enable you to better gage the amount injected. Keep the needle in position a moment after injection to prevent return of the fluid.

Touch the mucous membrane at the place of perforation with a little pure carbolic acid. This will largely prevent subsequent pain in the neighborhood.

Explore the cavity before using the engine, to make sure that the tooth is desensitized.

If you don't intend to fill permanently at the same sitting, cover the dentin with a thin layer of cement before inserting the temporary stopping. This insures against reinfection and makes the subsequent drying of the cavity with alcohol and hot air a painless procedure.

Do not be afraid to try this method. It may look delicate, but remember that you are a skilled surgeon, and delicate operations are expected of you. Moreover, it is your aim in this age of advanced science to operate painlessly. It is being slowly demanded on all sides, and soon the pain incident to our work will no longer be tolerated.

This method is not perfect. Study for improvements. Criticize if you will, and the outcome will be something better. If so, no one will be more pleased than the author.

CASTING: A REVIEW AND COMMENTARY, INCLUDING A TECHNIQUE

Which Makes Possible a Casting of the Same Size as the Wax Pattern at Body Temperature.

By C. S. VAN HORN, D.D.S., Bloomsburg, Pa.

(Read before the Susquehanna Dental Association of Pennsylvania, at its annual meeting, at Harvey's Lake, May 24, 1910.)

THIS paper is compiled from notes, correspondence, conversations, and experiments, together with the practical application of the casting process, covering the period from its general adoption by the dental profession to the present time, the main object being to present a summary in a manner suited to comparison, analysis, and synthesis, that we may, through impartial discussion, help one another to arrive, by logical deductions, at rational conclusions, and perhaps in some instances to transform chaos into cosmos.

The assumption that gold and its alloys when cast under a definite sustained pressure would disobey one of the prominent physical laws—viz, expansion upon the addition of energy (heat) and contraction when the energy is withdrawn—was indulged in by early writers and concurred in by superficial thinkers. But now we have a repetition of history, in that when hypotheses diametrically opposed to known laws are promulgated the checking process begins.

VARIOUS VIEWS ON SHRINKAGE.

A review of the literature on the shrinkage problem shows that while all who have gone to the trouble of making measurements are in unison as to there being a shrinkage, there is a wide diversity of opinion not only as to its amount, but also as to the manner or method of controlling or modifying it.

Price claims (*Items of Interest,* May 1908, p. 363, "The Laws Determining Casting or Fusing Results, Their Control, and a New and Rational Technique") that—

> With the casting machine giving 1/100 of a pound actual pressure on the inlay, the total contraction on cooling of pure gold will be about twenty thousandths per inch . . . . and with the machine giving 5½ pounds, a contraction of about thirteen thousandths.

—a reduction in shrinkage of 0.007.

Ward says (DENTAL COSMOS, September 1909, p. 1052, "A Consideration of the Casting Process, with Special Reference to Refractory Materials"):

> We cannot say, then, that cast iron, brass, gunmetal, copper, lead, zinc, etc., that are used every day in the foundries, have fixed and definite coefficients of contraction. We must understand that with every reduction in the size of the casting there is a new and smaller coefficient of contraction. The natural question is, Why? Because the larger casting remains hot longer than the small one. In other words, shrinkage is in proportion to the amount of material used, simply because the material for the small casting chills the moment it strikes the mold.
>
> The lesson for us to draw from the theoretical engineer and the practical foundryman is quite forcible and obvious. We are to cast our gold into molds which have been heated sufficiently to eliminate mechanical moisture and allowed to cool till they can just be handled with the hands without discomfort, if we are to place the casting of

gold on a practical as well as a scientific basis.

If the casting be a compound approximal one for a molar measuring ½ inch, we can only calculate a total shortening mesio-distally of 0.0016 in. . . . . These figures will not hold good for casts made in a red-hot mold or if the gold is superheated. They hold good for casts made of gold heated above its melting-point and cast into a cool mold.

Lane's experiments (presented before the 1909 meeting of this society, also briefly referred to in the *Dental Digest* for July 1909, pp. 498–499), lead him to the conclusion that pressure has no influence whatever in controlling or modifying the natural shrinkage of the gold, but that by having the flask and investment at red heat at the moment of casting, the shrinkage of the gold is somewhat neutralized. To quote:

We recently conducted a series of experiments along this line, and proved to our satisfaction that no amount of pressure that we could use in this work—45 lb. per square inch was the highest we tried—would prevent shrinkage. And furthermore, that any pressure that was barely sufficient to place and hold the molten gold in the most remote portions of the mold, and give sharp margins wherever necessary—five pounds per square inch was the least we tried—showed no more shrinkage than heavier pressures . . . that the condition that had by all means most to do with shrinkage, or lack of it, was the temperature of the flask at the moment of casting. . . . . We made castings that showed shrinkage of only 0.0008 in. from a pattern that was 0.5000 in. (half an inch) by having the flask exceedingly hot at the moment of casting, and from the same size pattern and the same bowl of investment had a loss of 0.0082 by shrinkage. We thus can considerably vary the size of the casting by varying the temperature of the flask.

While the foregoing review is of the briefest, it shows conclusively, as do the complete articles quoted from, that someone is in error; for it is obviously impossible to arrive at conclusions so completely antipodal and still be within the pale of logical reasoning.

Looking at the problem from a practical standpoint, and at the same time keeping in view that law of physics which has to do with the physical effect of heat on solids, it would seem that Lane's experiments and conclusions are not only the most logical, but that his remedy is the most practical.

Assuming that a pressure of 5½ lb. would reduce the shrinkage of gold 0.007, a material far more resistant to force than we at present have must be employed. Dr. Price, realizing that fact, gives us the technique for a new model material, the use of which necessitates the taking of an impression (please differentiate between an *impression* and a *pattern*) of the cavity and tooth-walls, building the model in the impression, and after investing casting in the model. One objection to the model and impression method, for an operation so exacting, is in the questionable transfers from the original, with the consequent element of error always to be anticipated and not subject to correction, and which therefore contra-indicates its employment—except, perhaps, in the most favorable cases.

As pig iron is more or less variable in composition—*i.e.* its constituent elements vary as to their quantity—the practical foundryman must know the formula of the iron which he is going to use in order to calculate the shrinkage; and in view of the fact that Dr. Ward's deductions are based largely upon cast iron, the formula for which is not given, that he does not give us measurements, except by analogy, and that he does not explain why the rapid cooling of gold modifies the natural shrinkage, except to say that it is because of the rapid cooling, we cannot consistently consider his remarks in connection with the shrinkage problem.

In considering Dr. Lane's experiments we are forced to take notice of the fact that he conducted them in much the same manner as though working with practical cases in the mouth, using our present investments, machines, etc., and, above all, taking advantage of the physical effect of heat upon solids. In fact, his deductions seem to be in accord with recognized physical laws rather than opposed to them.

TEMPERATURE OF THE MOLD.

When the casting process was brought to the notice of the profession, casting in a cold mold was advised, for the express reason, we inferred, of preventing disintegration of the investment by heat. Before making a single casting by the pressure process, your essayist was busily engaged theorizing, and after a time came to the conclusion that since a certain amount of heat was an absolute necessity to rid the investment of its contained wax pattern, it was unreasonable to permit the investment to pass through the additional change of returning to a cold state. He reasoned that as heat accelerates the swing of the molecules of the mass, our casting would more nearly represent in size the pattern when at normal body temperature if the mold was hot at the moment of casting.

Before considering the results of certain experiments which were conducted with the view of ascertaining the correctness of the above and of other reasoning, let us first consider the wax pattern.

In the experiments to determine the shrinkage in gold castings which have come to our notice, the thermal conditions under which the wax pattern was measured were not given. In fact, I am led to the conclusion that experimenters have assumed that the wax pattern was constant in its dimensions under varying thermal influences. But such is not the case, in proof of which the following linear measurements of a wax cylinder, approximately 3/16 in. in diameter, at various temperatures, is offered:

Cylinder measured—

At water temperature (56°)	0.5003
In an open doorway	0.5004
At room temperature (75°)	0.5009
At room temperature (78°)	0.5010
At body temperature (98.6°)	0.5017

Now, the point we desire to make is this: If we do not consider the thermal conditions under which our patterns are measured, how are we to determine the shrinkage?

We have made many measurements of patterns (wax cylinders) under varying thermal influences, and it has been found that the dimensions vary with the temperature. That you may grasp fully the significance of this point, let me suggest an experiment: Take a wax cylinder which measures, say, 0.5000 in. at body temperature; the wax cylinder is in the micrometer and the instrument reads 0.5000 in.; now let the cylinder remain in the micrometer until it assumes room temperature, say 75°, and the cylinder will drop out of the instrument; adjust the micrometer to the change in the pattern and subject the wax to a cool breeze in a doorway, and again the cylinder will drop out of the micrometer. Here is the result of one such experiment: A cylinder, made from a stick of pattern wax about 5/16 in. in diameter, measured 0.5002 in. at body temperature; 0.4986 in. at room temperature (80°); 0.4982 in. in doorway (75°); and 0.4976 in. under faucet (water 56°). Note the variation, 0.0026 in., from body temperature to the temperature of the water which would ordinarily have been used to mix the investment had a casting been made from this pattern.

In the following experiments to determine the advisability of having the flask hot or cool at the moment of casting, the pattern in each instance was a wax cylinder approximately 3/16 in. in diameter, the linear dimensions being as follows:

Hot Mold.

Pattern.	Temperature.	Casting.	Loss.
(1)			
0.5017	75°	0.5005	0.0012
0.5025	98.6°		0.0020
(2)			
0.5020	78°	0.5011	0.0009
0.5028	98.6°		0.0017

Cool Mold.

(1)			
0.5017	70°	0.4968	0.0049
0.5023	98.6°		0.0055
(2)			
0.5017	78°	0.4955	0.0060
0.5024	98.6°		0.0069

In the "cool mold" casts a gas blowpipe was used, and in no case could we begin to handle the flask immediately

after casting. Had an oxyhydrogen blowpipe been used a cooler flask would have been possible, and a consequent increase in shrinkage would be recorded.

These are not selected casts, but casts that were made expressly for this paper, and are recorded in the order in which they were made. We have made many casts in various ways and under varying conditions, but the greatest shrinkage yet recorded from a pattern approximately 3/16 x ½ in., casting in a hot mold, is 0.0016 in. We realize fully the difficulty of making accurate measurements of wax patterns, especially at body temperature, and we are not claiming absolute perfection for our experiments; but we would point out that the greatest care possible was exercised respecting every detail in this work, and even if slight errors did creep in, they in no way influence the contentions except in degree.

In all the experiments recorded in this paper, we used Taggart's pattern wax, Caulk's investment, 5 dwt. 24-k. gold, a casting machine employing the vacuum principle gage at 15 in. (approx. 7 lb. per square inch), and a Starrett micrometer having ratchet stop. Each casting was cleaned in hydrofluoric acid before being measured.

SIZE OF THE CASTING AS COMPARED WITH THE PATTERN.

Let us now consider some experiments, the result of which I have no doubt will be more or less astounding. I have never seen published any authentic measurements that showed an increase in the size of the casting over the size of the pattern at room temperature; and if you were to tell anyone who had gone through the "casting mill" that you could make a gold casting that would show ever so little gain over the size of the pattern—well, you would probably be placed in the Ananias club as a life-member exempt from dues. But this is exactly what I propose doing—not joining the club, but rather giving you the results of certain experiments looking toward the neutralization of the shrinkage in gold castings.

The following castings were made from a wax cylinder approximately 3/16 in. in diameter, the linear dimension being as follows:

Pattern.	Temperature.	Casting.	Gain.
(1)			
0.5003	70°	0.5032	0.0029
0.5011	98.6°		0.0021
(2)			
0.5008	75°	0.5035	0.0027
0.5014	98.6°		0.0021
(3)			
0.5011	77°	0.5072	0.0061
0.5021	98.6°		0.0052

Compare these results with the shrinkage recorded when casting in as cold a mold as was possible when using a gas blowpipe. In that case we had a shrinkage of 0.0060 in. from a pattern measuring 0.5017 in. at 78° F., whereas in the above case we had a gain of 0.0061 in. over a pattern measuring 0.5011 in. at 77° F. Think what that means: From patterns of approximately the same linear dimension we have castings showing the astounding variation of approximately twelve thicknesses of regular platinum inlay foil.

I shall not be at all surprised if at first thought you refuse to countenance these results; for even after spending considerable time theorizing and experimenting, I could hardly believe the story the micrometer told me when the first casting—made by the technique which we had decided would, if properly executed, absolutely neutralize the shrinkage in gold castings—was measured.

Of course you realize that any great increase in the size of the casting over the size of the pattern at body temperature is not at all practical in inlay work, and the above results are not given as being of especial practical value, but rather to demonstrate beyond cavil what may be done by taking advantage of the well-known law that heat expands and cold contracts. It must be remembered, however, that while this law is always operative, different substances are not always affected in like degree—*i.e.* gold, wax, and the investment material which

we use, all have different coefficients of expansion.

In the first part of the paper we pointed out that as heat accelerates the swing of the molecules of the mass, our castings would more nearly represent in size the pattern if the mold was hot at the moment of casting. We have never had occasion to question the soundness of that reasoning; in fact, all our experiments have strengthened, if possible, our faith in it, and at times even caused us to appear ridiculous in the eyes of the uninitiated, for we have at all times and in all places held tenaciously to the principle; and now we stand prepared to prove every assertion we have made, either privately or publicly, for it is upon this theory that we worked out the technique that makes possible a casting of the same size as the wax pattern at body temperature.

Having proved that a hot mold gives a casting more nearly the size of the wax pattern, but yet showing a loss of from 0.0009 in. to 0.0016 in., we were at the end of our string, so far as a hot mold at the moment of casting was concerned, *i.e.* we had reached the limit of expansion in the investment by that means. But we didn't stop here. It was proved that a pattern (wax cylinder) at the temperature of the water with which the investment was ordinarily mixed (say 54° to 56° F., the temperature of the water used in conducting the first experiments for this paper), was some 0.0014 in. *shorter* than was the pattern at body temperature. Now, "It's a poor rule that won't work both ways," therefore to neutralize the shrinkage of the gold, *expand the wax pattern* by having the investing material and the flask at a temperature sufficiently above the normal body temperature, when the pattern is invested, to compensate for the shrinkage of the gold, which is in excess of the expansion of the investment. It was just this principle that gave us the astounding results in the experiments lastly referred to, viz, a gain in the casting over the pattern of from 0.0021 to 0.0052 in. at body temperature.

By quoting the footnote I had written on the slip bearing the data of experiment No. 3 in the table last given, you will readily comprehend the reason for this gain:

> The investment was mixed with water at 120° F. The flask was heated in the machine so that when the investment was poured in the flask, the latter was very uncomfortably hot to handle with the fingers. The flask was at no time permitted to cool, but kept in a constantly increasing temperature until the cast was made, at which time it was at full red heat.

NEUTRALIZATION AND COMPENSATION.

Now, to follow this technique to the letter gives us neutralization with a big NEUT and compensation with several COMPS. What is required is a practical, simple, easily executed technique, sufficiently elastic to meet requirements for all practical cases where casting is indicated. I only wish I could give you positive rules, but, owing to the multiplicity of casting devices and investments that are being used, this is quite impossible. The best that can be done at this time is to give you general directions which are easily carried out, and may as easily be modified to fill all requirements.

First, know precisely *what* you are doing and *why* you are doing it; use a *non-plastic* wax (more will be said about waxes later on); make a perfect pattern; have the flask and crucible-former (if you use one—I do not) just nicely warm to the fingers; mix the investment with water at a temperature of, say, 115° to 120° F.; work as rapidly as is consistent with perfectness; allow the investment to harden *at least fifteen minutes,* during which time the temperature of the flask—which should be about 110° F.—is kept as constant as possible; dry the investment very slowly, taking about half an hour from the time the drying-out process is started; when all the mechanical moisture has been eliminated, slowly increase the temperature until the wax is volatilized (not boiled or burned out), which takes another half-hour; when the investment assumes a brownish-black color, apply heat until it gets white

again; put the gold in the crucible, continue heating until the flask is at full red heat, and when the gold is at white heat, cast.

As was said before, I am very sorry that more definite directions are impossible. I had hoped to at least give you positive temperatures and data for a few different investment materials, together with suggestions for some apparatus to be used in connection with casting devices which are not scientifically constructed; but writing papers, doing experiments, giving clinics, working on committees, and, incidentally, buying bread, has impressed upon me the irrefutable fact that there is a limit to human endurance; consequently certain apparatus which would tend to simplify and make more positive the technique are yet in the "dream form." However, if you use the directions with any degree of horse sense, coupled with diligence, more perfectly fitting inlays will crown your efforts. For—everything considered—if we are to obtain superlative excellence in the *marginal* adaptation of our inlays we must have the molds hot at the moment of casting. Not only that, but the cavity must be properly formed, and the *cavity surface* of the wax pattern properly reduced before being invested.

THE CEMENT QUESTION.

The assertion that "If an inlay absolutely fit the cavity there will be no room for the cement" has foundation in fact, and gives rise to the following: The cavity for a cast gold inlay should be represented by a series of inclined planes so placed that they have the effect of mechanically drawing the inlay more closely to the divergent enamel walls; that portion of the wax pattern representing approximately the dentin of the tooth should be reduced by scraping or carving with a very sharp lancet so as to favor this close adaptation, and the casting be made by the method insuring little or no shrinkage—depending upon the case.

It may be true that cement cannot be reduced to a film less than the thickness of No. 30 gold foil under an unbroken area represented by a block $\frac{1}{4}$ in. square, but we cannot reconcile our mind to the proposition that this holds good when cementing a gold inlay that bears only to the extent of one or two millimeters, from within out, on the cavity walls. In fact, we are disposed to the opinion that the above technique gives so close an approximation to actual *marginal* contact that cement disintegration is not a consideration—notwithstanding the hypothesis that a thin cement film will disintegrate sooner than a thick one.

THE GAS BLOWPIPE.

The assumption that 24-k. gold cannot be brought to a state of fluidity sufficient to fill every cavity in a cold mold by the use of an ordinary gas blowpipe is ambiguous. If you consider the amount of heat and the time necessary to fuse 4 or 5 dwt. of gold with a gas blowpipe in the crucible formed in the investment, you will at once see how impossible it would be to cast in a cold mold; since the transmitted heat would make it impossible to handle the flask with the fingers at the moment of casting. But since this may not cover the contention in its entirety, I will not only add that it can be demonstrated beyond dispute that sharp castings may be made by using the gas blowpipe, but I think that with the machines now in use more perfectly fitting castings result.

CASTING DEVICES.

Much has been written *pro* and *con* on the various devices with which casting might be done. That part of Dr. Ward's article previously quoted from respecting crude devices is pertinent, as are also some of his remarks regarding the requisites of a more perfect device; *e.g.* "It is an absolute necessity, however, to have the gold as fluid as possible, and to get the mold filled as quickly as it can be done. . . . Next to the temperature of the mold"—we disagree with him as to the temperature—"no three things are of

greater importance than the temperature and fluidity of the gold and the quickness of the operation."

After carefully considering all that has come to our notice respecting casting and casting devices, and then coupling to this our individual opinion of what a machine should be capable of doing to meet the various demands, or whims, of different operators, we are led to conclude that a device constructed in such a manner as would admit the use of either a gas or an oxyhydrogen blowpipe, and to have the flask hot or relatively cold at the moment of casting at the option of the operator; that would give a determinable pressure which would be sustained until the gold had crystallized (pressure sustained longer than this is neither essential nor does it in any way contribute to the perfectness of the casting); and that would admit the use of the blowpipe flame directly on the gold —which is in plain uninterrupted view, until the cast is actually made—would tend to fill most of the requirements at this time, so far as the machine problem is concerned.

At first blush it might seem that a device having so wide a range would be so complicated as to be undesirable, but in reality it is comparatively simple to construct a device so that all this, and even more, is at the disposal of the operator. At the conclusion of this paper you will be given the opportunity of inspecting such a device, which in one form or another has been used in my laboratory for the past two and a half years, being improved from time to time to meet such demands as scientific investigation and experimentation by myself and others had proved to be of value in perfecting the casting process—making results more positive, and above all, more perfect.

PATTERN WAXES.

Following in the wake of machines we have the variety of comments respecting pattern waxes. How anyone having used a non-plastic wax sufficiently long to have become acquainted with its manipulation, can find a place in their inlay armamentarium for a plastic wax is beyond my comprehension. By a plastic wax we mean one that will, at body temperature, admit readily of spreading, bending, or stretching, and a non-plastic wax is one that is *not* readily susceptible of spreading, bending, or stretching when at body temperature, but which will, if sufficient force be applied, break with a clean fracture.

When we consider the unreliableness of a plastic wax, both in and out of the mouth; that it must be kept much *below* the normal body temperature to be *non*-plastic, and the difficulty of so keeping it during the process of carving and polishing, it is quite astounding that it still continues to receive recognition by inlay workers.

SOME CAUSES OF FAILURE.

Cracked investments have been a stumblingblock in the path of many, the writer included; it is the result, in a vast majority of cases, of undue force.

Quite frequently we read that "Excessive heat will cause the investment to crack." I am not prepared to accept that theory unless the writers intend to infer that it is excessive heat in the drying-out process. In this connection permit me to quote from an article—a copyrighted article—recently read: "Just as soon as the investment has hardened and the base and sprue wire have been removed, the flask should be placed over a very low flame and allowed to remain at such temperature for five or ten minutes, or until all the moisture in the investment has been converted into steam and has evaporated." Imagine, if you can, heating a "green" investment sufficiently to convert the mechanical moisture into *steam* without having seismic or volcanic disturbances, or both! When water becomes steam it increases in bulk, so I am told, about 1800 times, *i.e.* a pint of water in the form of steam occupies the space of about 200 gallons of water. The drying-out process should be effected by slow evaporation, not by explosion.

Among other occasions of undue force there is danger at the time of casting;

this being especially noticeable with machines of the "plunger" or "steam-pressure" type, and it is just this inherent fault that makes these devices unreliable and precludes their use by those who think. It is not to be inferred that castings cannot be made with any of the devices in the market, but rather that with those devices in which the pressure is an unknown quantity the chances for success are in ratio to the acquired dexterity of the operator. Personal equation enters vary largely into the operation of the devices of the "steam-pressure" order, whereas the operation of the devices giving a determinable pressure upon the gold at the moment of casting is more or less automatic, depending upon the mechanical perfectness of the device and the source of pressure.

Casting over right-angle corners is said to be a source of failure; the fluid gold, it is claimed, in passing over the sharp corners of the mold has the effect of brushing the investment away, thus rounding or blunting the angle, and as, of course, if this were so, there would be a surplus of gold at the point so brushed, the inlay would not "seat." Having made several experiments along this line, and also having taken especial pains to note the effect when casting practical work that necessitated sharp angles, I feel confident that the presence of sharp angles *per se* in no way contributes to failure in the fit. Given a cavity the walls and floors of which are mechanically smooth and even, a casting can be made that will "seat" perfectly, no matter how many the angles or how sharp they be—and this without carving the cavity side of the pattern.

SUNDRY HINTS.

The assertion has been made that in restoring approximo-occlusal surfaces, separation should not be practiced. Of course this statement emanates from the orthodontia camp, and looked at superficially, from an orthodontic viewpoint, might have some weight were it a fact that all dentures are in normal occlusion, that normal occlusion is represented by a micrometric arrangement of perfect inclined planes, and if it were possible in a majority of cases to restore perfectly and permanently the mesio-distal diameter of the involved tooth without separation—none of which conditions, to my mind, has foundation in fact, nor are they considerations contra-indicating separation. The only deleterious effect, if any, that separation might have, so far as I can see, is the more or less remote possibility of inducing some pathologic lesion through the channels of inflammation. Surely, orthodontists will not object to that!

When the advantages to be gained are considered, I am strongly of the opinion that we are justified in separating the teeth sufficiently to admit not only the forming of a normal contact point *in situ,* but to facilitate the removal of the pattern without distorting its edges by rubbing against the cavity margins, and to admit the seating of the inlay without its binding.

Quite frequently we notice articles advising the finishing of the wax pattern in such a manner that a thin, narrow overlap is obtained beyond the true margin of the cavity; this overlap to be polished away after the inlay has been cemented in position. I have always held and still hold that this is decidedly disadvantageous, unscientific, and opposed to one of the important features of the cast gold inlay—which is, the burnishing of the margins of the inlay to the margins of the cavity, and thus reducing the marginal cement film. It can very readily be seen how an overlap that is subsequently to be ground away handicaps or makes impossible the "pinching off" of the marginal cement film.

I have never found occasion to use oil or grease of any kind on the pattern for an inlay; it is an abomination and is in no way useful. Dry absorbent cotton answers every purpose as a polisher, and it leaves the pattern free from oil. Tape has been advised as advantageous in polishing the approximal surface, but it has not been a success in my hands, it having a tendency to "drag" the pattern and flatten the contact. The patterns in the cavities of this typodont [exhibiting] show the standard that should be worked

to in carving and polishing. It will be noted that the patterns are finished flush with the cavity margins, and that they are as highly polished as any gold filling can be. In a paper, "Some Phases of the Casting Process" (Cosmos, May 1909, vol. li, p. 546), I endeavored to explain the technique of pattern-making. As some misunderstanding respecting the finishing of the pattern, as stated in that paper, has come to my notice, I would further elucidate this important part of casting by stating that it is not always possible to perfectly finish the pattern *in situ.* Finish the pattern as perfectly as possible while in the tooth cavity, remove with an explorer, and, if it be an approximo-occlusal restoration, attach the sprue, a brass wire of about No. 13 gage and 1½ in. in length, to the pattern at or near that part which represents the marginal ridge of the tooth. Heat the sprue so that it will melt the wax, and embed it firmly; the sprue wire thus serves as a handle, and any carving which is indicated may be done. As an illustration: Suppose the cervical margin of the cavity extends considerably beyond the free margin of the gum tissue; it more frequently happens than not that the removal of the pattern discloses the fact that "we have erred in our way like lost sheep" in the finishing of the cervical margin of the pattern; but we have an alternative which is not available in any other filling operation of which I have knowledge—we can carve the pattern "within a hair" of the impression of the cavity margin, then when the casting is made it can be finished down exactly previously to cementing. If the pattern and casting has been properly done, no finishing will be required after cementation. Rarely do I find it necessary to do any finishing after the inlay has been cemented and the accessible margins burnished; in fact, only in those cases which are conspicuous do I polish the inlay after cementing.

Gold of 24-k. is to be preferred for all inlays and crown adaptations, except in special cases where an alloyed gold is needed for its additional strength or hardness; in those cases a gold-platinum alloy is usually to be preferred. In no case is any gold of unknown identity to be used. The various base-metal alloys in the market may, on rare occasions, have a place—but not from the viewpoint of cheapness!

NOMENCLATURE.

In reading the various articles on casting we are confronted with such terms as "the impression," "the model," "the *disappearing* wax core" [*sic*], etc., which we are to assume refers to the pattern. It is not my intention to appear hypercritical, but in view of the fact that impression, model, and *core* signify quite different procedures or things, especially to us as dentists, would it not be a mark of prudence, not to say correctness, to apply the simple, significant founding term, *pattern;* using the word "wax" to designate the material from which the pattern is made or the use for which the material is intended? This would give us a definite terminology free from confusion: *wax pattern* and *pattern wax.*

I have endeavored to bring before you most of the important problems pertaining to the casting process. It remains with you to bring out in the discussion anything of importance that has either been omitted or that is of especial value to you. The object of the paper is, as previously intimated, to bring out through impartial discussion any and every thing which will tend to help us to arrive at rational conclusions.

In closing, I would call your attention to the fact that even though many of the problems pertaining to casting are yet unsolved, both the technique and the devices have been perfected sufficiently that no operative dentist can afford to risk his reputation for progressiveness, not to mention conservatism, by delaying the adoption of the process. I will go farther than that: I am willing to go on record as saying that the operative dentist who is not utilizing the casting process in his practice is not rendering to his *clientèle* the service which is their due—he is not working to the limits of present possibilities in operative procedures.

THE PSYCHOLOGY OF THE TOOL-USING FACULTY.

By ALTON HOWARD THOMPSON, D.D.S., Topeka, Kansas.

(Read before the National Dental Association, Southern Branch, at Houston, Texas, May 4, 1910.)

"The human hand was forged from the fin of a fish by the human brain."—HUDSON MAXIM.

IN a profession where so much depends upon the efficient application of scientific discoveries to practical uses in the service of humanity, the skill of the hand in the use of tools is of paramount importance. By this skill we maintain our position and efficiency as ministers to human suffering. It is therefore important that we should have a scientific knowledge of the tool-using faculty, to the end that we may be the better able to fulfil the demands made upon us in that service. Let us therefore go back to nature, the primary basis of all things, and endeavor to discover and trace, if we can, in a feeble way, the origin and evolution of this faculty. It is a long story, so we cannot go into much detail, and will only touch upon the salient points; but even these will throw a flood of light upon a subject which is fraught with interest to us as dentists.

RATIONAL USE OF TOOLS AND WEAPONS BY ANIMALS DISCLAIMED.

Nature, with her ever-provident generosity, has endowed many animals with the power and means for reducing material substances for food and other purposes. The means whereby this is done are usually specially developed organs of the body, which have been modified by use and evolution. Thus the teeth were specially developed for food reduction primarily, and thence, in some instances, as secondary organs to serve as tools and weapons, as, for example, the canines of the carnivora, the chisel-shaped incisors of the rodents, the tusks of the elephant and walrus, etc. Other parts and organs are specially developed as tools and weapons also, as the tail of the beaver, the forceps of the lobster, the horns of the ungulates, etc.; thus there are many instances of the special development of organs which are parts of the organism and attached to it. But we are now considering the use of extraneous substances as tools and weapons, which is rare among animals. This operation is quite beyond the psychic capacity of most animals in their native state, and training by man is of course ruled out. There are, however, a few curious instances, as that of a little female yellow-jacket which uses a small pebble to pound down the earth of her nest; but such instances are rare among lower forms. Many stories are told of the use of clubs and stones by higher animals, especially the quadrumana, which must be taken with allowance, for travelers are much given to exaggeration. Many animals seize objects that can be grasped by various organs of prehension, but such actions are mainly automatic, instinctive, and irrational. We have been told by many travelers that apes and monkeys employ clubs as weapons, stones and nuts as missiles, etc.

In order to make definite investigation of the subject, the writer addressed the keepers of the quadrumana in various zoölogical gardens in order to ascertain what they had observed as to the original and uninstructed use of external objects as tools and weapons. The keeper at the

zoölogical garden at Philadelphia courteously replied: "The whole subject of the psychology of the lower animals, to which your letter refers, is one on which trustworthy evidence is very scarce. Personally, in twenty years of observation of wild animals, I have never seen a case of the application of such means to such ends as that of stones for tools and weapons on the part of a monkey which could be believed to show conception of purpose. I am inclined to think the recorded cases largely accidental or the result of misconception or imagination."

Dr. Frank Baker of the National Zoölogical Park at Washington, writes: "One monkey in our collection, when annoyed by visitors, will throw anything from a feed-pan to a handful of sawdust at the offender. One cebus tries to pick cockroaches out of the cracks of the floor with a straw when too small for his fingers. Beyond that, there has been nothing observed that could be considered as the using of an object as a tool or weapon." Other correspondents gave the same testimony, that no actions had been observed on the part of the quadrumana that could be taken as indicative of an intelligent plan in the use of tools. In his book on "The Speech of Apes and Monkeys," Prof. R. A. Garner, who spent some time in the wild country of the Gaboon on purpose to pursue his studies, says that "animals may be taught to do many things in a mechanical way without motives that relate to the actions." His pet chimpanzee tried to drive nails, use the saw, and perform other simple actions, but could not do them, nor even the simple striking with a club to crush his sugar-cane. Of the gorilla he says: "As to his throwing sticks or stones at his enemies, there is nothing to verify it and much to contradict it. Neither the chimpanzee nor the gorilla close the hand to strike, or use any weapons but the hands and teeth." Mr. Chas. Morris says in his book "Man and his Ancestor": "The species of quadrumana that use missiles fail to take aim, for two reasons. One is, the only occasional employment of the faculty, in imitation of human actions, and the other is that their arms are ill suited for this action from their different adaptation to locomotion in climbing and swinging in trees." From all the evidence thus acquired, we must conclude that the use of extraneous substances by animals, especially the quadrumana, is purely imitative and automatic, and is not to be considered as rational at all.

MAN'S USE OF TOOLS AND PSYCHIC EMERGENCE COINCIDENT.

We must conclude further that the use of tools and weapons, even preceding their artificial conformation for definite purposes, marked the time of the differentiation of the primitive man-ape from the animal branch, and accompanied—indeed, was the cause of—the psychic emergence. The moment that the forerunner of man employed extraneous objects intelligently with a purpose as tools and weapons, he ceased to be an ape and became a man. We must believe that the first use of tools and the psychic emergence were coincident and interdependent. As Morris again says (*op. cit.*): "The habit of using implements is one of supreme importance in animal evolution. To it we owe man as he exists today. While animals confined themselves to their natural weapons of teeth and claws, their development must have remained a very slow one, and have been confined within very narrow limits. When once they began to add to their natural powers those of surrounding nature by the use of artificial weapons, the first step in a new and illimitable evolution was taken. From that day to this man has been occupied in unfolding this method, and has advanced enormously beyond his primal state. A crude and simple use of weapons gave him in time supremacy over lower animals, and an advanced use of external substances has given him supremacy over nature herself."

MAN'S EVOLUTION AS DUE TO TERRESTRIAL HABITS AND OMNIVOROUS DIET.

The struggles of the first man-ape to maintain his existence amid the hostile

surroundings in which he found himself are fraught with peculiar interest, and are even pathetic when we consider the odds which were against him in the fight. He well employed what gifts nature had bestowed upon him with such skill as he possessed, and by the cultivation of that skill made of himself a new being. His own natural weapons of teeth and claws were being rapidly reduced, and would needs soon have brought about his extermination but for the development of the grasping powers of the hand, which enabled him to employ the extra-natural resources around him. These natural weapons came in opportunely to supplement his own waning powers. The reduction of the jaws, teeth, and claws were a correlative variation due to the assumption of the prehensile function by the hands and the attaining of the erect attitude. From the primitive arboreal prototype it is probable that the later ancestor of man descended to the earth, and became semi-terrestrial in habit, like the anthropoid apes of today. But the grasping power of the hand still remained and was developed for other purposes than climbing, and with its growth the seizing and prehensile functions of the jaws and teeth were superseded, and thus became useless. These parts were correspondingly reduced according to nature's well-known law of economy of growth. For, as Darwin well says in his "Descent of Man": "As man gradually became erect and continually used his arms and hands for fighting with sticks and stones, as well as for other purposes of life, he used his teeth and jaws less and less. The jaws, together with their muscles, were then reduced through disuse, as well as the teeth through the principles of correlation and economy of growth." This law of correlation is one of the most wonderful chapters of human evolution. The teeth and jaws of man are of such embryonic form today that some other influence must have supervened to have accomplished their reduction aside from mere food reduction and disuse. This power in man's primitive ancestral type was undoubtedly the developing of the grasping power of the hand and its usurpation of the prehensile function. While the ancestral form of man became gradually adapted to terrestrial locomotion, he retained the erect attitude, and thus the upper limbs were left free to be employed for other purposes than arboreal locomotion. As Chas. Morris again says (*op. cit.*): "The organization of man renders it questionable if his immediate ancestor was arboreal to the extent of the monkeys and lemurs. He probably made the ground his habitual habitat at an early period in his history, and the result of his new habit was a change in the relative length of the arms. Unlike the kangaroo, the extinct dinosaur, and other animals that have learned locomotion on the hind legs alone, the front limbs were not excessively reduced in man, for the reason that they were gradually diverted to the performance of other duties, and were kept employed. It is also quite probable that the man-ape at an early day became omnivorous in his diet by adding flesh food to his fruits and nuts, and this would demand more active employment of his hands and arms in the capture of prey. This necessary activity did not fail to modify to a great degree the use of the arms, and interfere with their utility in locomotion, so that more liberty would be necessary to render them effective. The acquisition of these two new habits of life, *i.e.* descent to the ground and the addition of carnivorous food to his dietary, contributed largely to the evolution of the faculty of employing clubs and stones for striking and throwing, rendering man's ancestor thereby better able to survive in the struggle for existence, and was the first cause of his subsequent marvelous evolution. He could not only fight better, but he could procure food more easily, and thus much was contributed to the solution of the two greatest problems of primeval life. How long ago it was that early man left the trees and made his home upon the ground, it is impossible to say. It may have been as far back as the early pliocene or the late miocene period, or even earlier, but in his new habitat man was

exposed to novel conditions that must have exerted a stimulating influence upon his mind. Such a new series of duties exerted a vigorous influence upon the brain, already quick of thought and susceptible to fresh impressions. The man-ape entered upon a new and rapid phase of mental progress, his brain developing in power and growing in dimensions as it slowly became adapted to its new situation and grew able to cope with fresh demands and critical emergencies."

EVOLUTION OF MAN'S THINKING POWERS COINCIDENT WITH THE INCREASE OF MANUAL SKILL.

The important consideration is, that in connection with the evolution of the grasping powers of the hand, as primitive man learned to use clubs and stones as tools and weapons, and came to aspire and attempt more precision and skill in their use, these efforts taught him to think. It was this important step in his evolution that marked the era of man's psychic emergence from the animal kingdom and his emancipation from the thraldom of mere animal mentality. The awakening of the consciousness of a desire for greater precision in the use of the hand acted as a stimulus on the nerve centers controlling motion, and these centers became enlarged by reason of the efforts put forth to accomplish the desire. It produced the difference between the mere animal with his automatic brain, and the predestined thinking man. The vital spark that first lit up the animal mind of the ancestral man-ape acted as a stimulus on the nerve substance, and it grew, and as it grew he thought more, and as he thought the more his brain grew, and he became a man. As Prof. J. D. Cunningham has well said (Proceedings of the British Science Association, 1901): "In man certain portions of the cerebral cortex have been greatly enlarged, and there is no corresponding enlargement in the simian brain. It is not difficult to account for this important expansion of the cerebral surfaces. In the forepart of the region involved are placed the groups of motor centers which control the muscular movements of the more important parts of the body. Within this are the centers for the arm and hand. In man these have undoubtedly undergone marked expansion. The skilled movements of the hand, as shown in the use of tools, have not been acquired without a corresponding increase in the brain mechanism by which they were guided. So important, indeed, is the part played by the human hand as an agent of the mind, and so perfectly is it adjusted with reference to this office, that there are many who think that the first great start which man obtained on the path which has led to his higher development was given by setting his upper limb free from the duty of acting as an organ of support and locomotion, and the assumption of the different duties of prehension and precision in the use of extraneous objects as a resource for the purposes of life." Thus the brain received a stimulus by the dawning of the idea of using the hands, with the consequent reactions in both directions, *i.e.* the increase of manual skill and the evolution of thinking power. The manual concept reacts upon the mental concept, and the stimulus is mutual and retro-active. This mutual effect is well understood and utilized in special fields of training for the muscles and the brain. In dealing with criminals, defectives, and incapables in reformatories and special institutions for the defective classes, it is a well-known fact that the training of the muscles and the manual powers is the first step in the process of arousing the dormant powers of the mind. The results of this method have been simply marvelous, as all who are engaged in the work of reclaiming defectives can attest. As Dr. E. S. Talbot in his book on "Degeneracy" says, "Manual training is a principle long adopted in idiot schools, where the training of certain muscles through both mental and physical methods precedes intellectual training alone." Manual training in the common schools is now looked upon—and the results well

attest its value—as a desirable, if not necessary adjunct in the work of the awakening and developing, not only the physical powers but also the mental life of the children. Its effects upon the dullards is like an inspiration. The reflex effect of manual effort, of the consciousness of manual precision upon the brain is well understood wherever displayed. This effect, we are bound to believe, was the potent power that awakened the mind of primitive man, and his psychic emergence was due to that awakening. From that moment he ceased to be mere animal and became man.

THE ARTIFICIAL SHAPING OF NATURAL SUBSTANCES INTO TOOLS AND WEAPONS, AS COMPLETING MAN'S EVOLUTION.

The next important step in his evolution was the additional spark of intelligence that suggested the artificial modification of natural substances as tools and weapons to better adapt them to his wants. The first conception that a pointed stick was better than a blunt one, which great fact suggested the possibility of shaping the stick by hand, was a forward step of the greatest possible importance. When man discovered by accident that flint chips could be made by hand, he thus placed in his grasp the invaluable stone knife, which, with its subsequent modifications, opened up a vast field of resources and added to the food supply and even to the comforts of life. The very first step in the direction of the modification of natural products indicated his complete emergence from the animal stage. From this point on his mental evolution was rapid. From the sharpened stick he advanced to its hardening in the fire, then he attached to it still harder points of stone and bone, and from this was developed the highly effective spear and arrow. From the pounding-stone was developed the sharpened and grooved ax, with its many modifications, and the subsequent attaching of a handle to it marked a notable step in intelligence. As a missile the stone did not undergo as great an evolution as the hammer in early savage life, but in modern warfare the missile has become the most important and effective weapon.

THE TOOL-USING FACULTY THE MAIN FACTOR IN HUMAN EVOLUTION.

The further development of the tool-using faculty indicates the path of the rapid evolution of the mental powers that has been the salvation of the race. From primitive times the tool sense has been the power that dictated mental evolution. It is the faculty that prompted the marvelous industrial development of the last century. It is the keynote of our civilization. Coincidently, there has been developed a power of ratiocination in the mind of modern man in all directions, both abstract and concrete, that owes its origin to the tool-using sense. With all our pride of mind, we must not forget our humble beginnings in this, as in other branches of human evolution, and the slow progress along the pathway of long mental training by which our mental superiority has been brought about, and our dominion over the rest of the animal world has been made secure. The establishment of that dominion preceded our conquest of nature and the enslavement of her powers, which was the direct result of the evolution of the tool-using sense. By reason of this wonderful development, man may well say with Descartes: *"Cogito, ergo sum"*—I think, therefore I am.

DENTAL CLINICS IN MANILA: SCHOOLS, PRISON, HOSPITAL, AND ORPHANAGE.

By LOUIS OTTOFY, D.D.S., Manila, P. I.

IN view of the widespread interest aroused in the dental profession of the United States in the necessity of caring for the teeth of the school children, in recognizing the economic factor and in the humanitarian phase of the subject, which was the basis of an editorial in the January 1910 number of the DENTAL COSMOS, I consider it opportune to relate the history of this work in the most distant important city over which waves the "stars and stripes."

My interest in this subject is of long standing, for in 1883 I read a paper before the Illinois State Dental Society (1) in which I reported the result of the examination of the teeth of 355 school children, which constituted the *first investigation* of that character in the world. About the same time, Dr. Julius Parreidt of Leipzig, Germany, collected valuable data along the same lines, and prepared statistics in reference to the prevalence of caries (2).

Since that time I have presented several papers (3), until my study of this subject now covers 1356 children and 31,236 teeth, distributed among Americans, Filipinos, and Chinese school children (4), and among barbarian Igorot children (5). While I never considered it of any practical value, I also examined the teeth of lepers in Japan (6) in 1899 and lepers in the Philippines (7) in 1903. In the meanwhile I have closely studied and watched the progress of this subject with intense interest, especially in Germany, where the most pronounced results have been attained.

FREE DENTAL CLINIC AT MANILA.

In an attempt to improve the condition of the teeth of school children, prisoners, the poor, the inmates of eleemosynary institutions, and others more or less dependent, two vital difficulties are met with: First, the lack of necessary funds and of the interest of those who control them; and second, the lack of dentists to do the necessary work. I will endeavor to show what has been accomplished in Manila along these lines until the work has assumed important proportions, at the same time fascinating, pleasing, and creating a desire for more to be accomplished. The first free dental clinic in Manila, so far as I have been able to learn, was established in January 1904, and in regard to that, in a paper on "Dental History in the Philippines," I reported as follows at the meeting of the Fourth International Dental Congress at St. Louis, in 1904: "In this large city of Manila, containing as it does a native and Chinese population of nearly a quarter of a million, there is no place where the poor can get relief, except a small free dental clinic which I established last January and have since maintained in connection with St. Luke's Hospital. The mass of the people know absolutely nothing of dentistry."

That clinic I visited three times a week at 8 A.M., but the hospital was out of my way, and the loss of time was not justified by the results. Hence I was looking for a larger field, and after the meeting of the congress I secured from manufacturers of dental goods, chemists,

and publishers donations of dental equipment, drugs, books, etc., to the value of $800, for the establishment of a clinic. As it is not customary to look a gift-horse in the mouth, these donations were gratefully received no matter of what they consisted, so that I found there was on hand an excess of some supplies, while others were entirely wanting. On my return to Manila, a large hospital was being organized, and I was invited by the chief surgeon to establish a clinic therein, but without special financial aid from the hospital. Dr. R. E. L. Newberne, of the bureau of health, kindly donated a dental engine, some hand instruments, and very useful odds and ends. Dr. G. L. Mitchell loaned a bracket table, and Dr. Juan Arévalo (now deceased) loaned a chair, and I pieced out from my instruments a fair equipment. Permission was obtained from some of the donors to dispose of part of their donations, and with the money thus obtained to purchase other appliances for the clinic. A large quantity of drugs, principally antiseptics, hydrogen dioxid, listerine, etc., were given to and used by the hospital in partial reimbursement for fitting up the clinic room, and thus a fair outfit was brought together.

On May 1, 1905, the clinic was formally opened at St. Paul's Hospital, and my first plan was to conduct it in cooperation with other dentists. Six members of the profession agreed to be at the clinic room, each one once a week for two hours, from 7 to 9 A.M., thus giving a six-day service of two hours each. (It should be borne in mind that in Manila business hours begin very early in the day, hence 7 A.M. is nothing unusual, as practitioners are generally at their offices before 8 o'clock.) All service was to be confined to the poor, and performed without remuneration. This method soon proved unsatisfactory. While I stopped at the clinic room daily at 7 A.M. on my way to the office, my *confrères,* for one reason or another, one by one dropped out. But gradually, as the existence of the clinic became known, the number of visitors increased, and shortly a young native who had studied and had some experience in dentistry but who was not licensed to practice, was employed at a nominal compensation, which was paid by the hospital, and at the same time a small fee was exacted for fillings and an occasional crown or denture, all collections being turned in to the hospital. Indeed, the matter of accepting a fee came about through the request of many of the poor, who claimed that they could pay something, so small a fee as ten cents being often paid for the extraction or treatment of a tooth. The young assistant, through his personal energy among friends, soon had a number of patients, which enabled the clinic finally to repay the hospital for the original outlay, and by services to the sisters of charity eventually to liquidate in kind for all aid and assistance given.

The assistant was succeeded by another young man of the same status, who is, however, quite a competent man, and who ever since 1906 has been in charge of the clinic. Gradually the income increased until all expenses were met therefrom, additional equipment was bought, and finally the clinic was made to support one in the prison, and extended to the public schools, as shown hereafter. As the average native cannot stand long hours of steady work, the clinic hours were set from 8 to 12 daily, except Sundays and holidays.

THE PRISONS.

Feeling, however, that we could do something more, in June 1906 I extended the work to Bilibid prison. This institution has in the neighborhood of 3000 inmates, and is something in the nature of a federal prison, to which long-term prisoners from all parts of the islands are sent. For Manila it serves the purposes of both penitentiary (*presidio*) and jail (*carcel*).

Once a week for nearly four years a prison vehicle has called for the assistant and his instruments, transporta-

tion being the only thing furnished by the prison. Last year a new modern hospital was built within the prison walls, and I concluded to sound the warden in regard to compensation, the services having proved satisfactory, humane, and valuable. I proposed that we be paid $170 for thirty-four months of past services, and if that sum were allowed, we would ask the prison authorities to purchase for us an equipment to be placed in the hospital of the prison, and to be the property of the prison. This offer was promptly accepted, and today Bilibid is one of the few prisons of the world where there is a neat, fairly equipped dental office, with a new Morrison chair, White engine, Allan table, etc. A special room is assigned for the dental work, and I am now arranging with the prison authorities to have made in the prison shops a cabinet, work-bench, shelves, etc. A few of the prisoners who have funds have paid for dentures, crowns, and bridges, but there is not much of this kind of work, and as it is done at an exceedingly moderate fee, there is practically no profit from it. There is a young prisoner, at present at the Iwahig Colony—an outdoor adjunct of the prison on one of the southern islands—who is undergoing a long sentence for *bandolerismo,* that is, for being a member of a band of outlaws. The young man is not a bad man, but one who has been misled into opposing American authority by older and what should have been wiser heads. He was for some years the assistant of a dentist in the provinces, and I am informed is quite capable. I shall, when the clinic room at the prison is well equipped, endeavor to have him transferred to the prison and placed in charge of the clinic, so that urgent relief to prisoners may be given at any time. At present the condition is not satisfactory, although extractions are willingly made at any time by the medical staff of the hospital. Should this young man prove efficient, I would recommend that he be pardoned on condition that he remain with the prison as dentist for a specified time, during which he will train some other prisoner to take his place.

I believe that eventually the prison authorities will recognize the value of the clinic aside from the humanitarian phase, in the increased economic productivity of the prisoners, for Bilibid is an important industrial institution, where all sorts of articles are made—furniture, wagons, machinery, etc., principally for the use of the government. In time, I believe, financial aid will be given commensurate with the value of the results.

THE PUBLIC SCHOOLS.

From the income of these clinics, earned under my supervision by the assistant at St. Paul's, I have now extended the work to the public schools. For this purpose a young student has been installed, with an equipment made up from that at St. Paul's Hospital and from my own case. This work is for the present limited within the ability of the assistant, and is fourfold, viz:

(1) To interest each child who comes into the chair as to cleanliness of the mouth, the bad effects of the opposite condition on the general health, etc.—briefly, to teach dental hygiene.

(2) To advise those who are suffering and need extraction to go to St. Paul's Hospital, where it will be done for them free of cost—and of this advice quite a number have availed themselves.

(3) To treat aching teeth, inflamed gums, and give temporary relief, and

(4) To insert a few simple plastic fillings, merely to acquaint each child with dentistry, in the hope that in future the child will reason why it is that an unfilled tooth continues to decay while a filled one is preserved, and so be led to seek the service he requires.

This work is conducted absolutely without cost to the pupils and the school authorities, and will be continued until its value, here as elsewhere, shall have been demonstrated, and the necessary financial aid be forthcoming. While from my own and the examination tables

of others, I have known in a general way, of the deplorable condition of the teeth in the public schools, not until I had the opportunity to make these recent practical observations was I aware of the woful condition and the truly sad state of affairs. The work is commenced at half-past seven or eight in the morning, when I enter a schoolroom and ask the teacher to request all the children who have the toothache to rise. In a room containing from thirty to forty children from seven to ten will stand up. These, then, quietly, noiselessly, and without disturbing the work of the class, go to the operating room and are attended to. Unfortunately, in the school building we cannot do for them all that should and could be done; thus, were we to extract teeth or roots that badly need removal, the attendant noise, blood, etc., would cause a general fear to spread through the building, and further work would be impossible, especially when it is remembered that Filipino children—in fact, Filipinos in general—are timid, though often courage is not lacking. Therefore, I take it that we are merely inserting the wedge, gaining the confidence and above all the good-will of the children.

The reports of the work as it progresses are daily brought to me by the assistant, who occupies a vacant room in the school building, and who operates from 7.30 until 12, and sometimes until 1 o'clock. The following specimen report for one day, taken at random, shows the limited character of the inquiry, and the work actually accomplished:

School—Meisic. *Date*—February 21, 1910.

No. of patients (males 20, females 3)	23
No. of teeth examined	637
Requiring extraction	40
May be filled	45
Filled (amalgam 13, cement 2)	15
No. suffering	15
No. of treatments	28

It will be noticed that all the teeth are counted, and those beyond and not beyond salvation are separately noted, and a few of the latter are filled. On the day shown, 15 out of 23 were in pain, in some of them more than one tooth being involved.

The tables here given show only the worst aspect of the conditions—for be it remembered that, for want of time, only those children are seen who voluntarily present themselves, and these are naturally the ones who are suffering, or have the worst teeth.

The work was commenced on January 10, 1910, and in the interim, while some of the children were especially occupied with preparations for a carnival, I placed the assistant in an orphan asylum for girls, where the dental conditions were deplorable.

SUGGESTIONS.

In the future I shall little concern myself with ascertaining any further the condition of the teeth, but devote the entire time of the assistant to the actual work of saving teeth, giving relief, and whatever will prove of immediate practical value. As a suggestion to dentists in cities of the United States where they may contemplate undertaking this work, I will say that no further determination of the conditions of the teeth is necessary. It is now nearly thirty years since these systematic examinations were commenced, my own work dating back to 1882, when I covered in detail not only the percentage of carious teeth, but the chemical reaction of the saliva, noted the density of the enamel as well as the presence or absence of salivary calculus, diseases of the soft tissues, irregularity, and abnormalities. Since that time hundreds of thousands of teeth have been examined. In an able paper published last year ([8]) from the pen of Dr. Bunting of Ann Arbor, Mich., many other scientific details were included in his examinations, among them caries as influenced by types, stature, body and brain weight, etc. It is my judgment that this feature of the work may now be practically considered as concluded, for the fact is irrevocably established that, with a very few exceptions, all children are in need of dental services.

To those who desire to undertake this great work which is unfolding itself to the dental profession, I should simply recommend the going to work. The placing of the mouths of all children in a hygienic condition is now the paramount issue. Formulate any reasonable plan, suitable for your town or community, and at once begin to do the actual work. I doubt whether there is any better method of teaching dental hygiene than by giving the children the practical demonstration in their own mouths.

When the schools reopen next June, I intend to follow an entirely different course from the experimental one on which I report in this paper. I propose to have the assistant give relief to any one of the 2000 children who attend the school where he will be installed, but the actual effort will be put into one schoolroom at a time. That is, I propose to have in one room everything done that is necessary for every pupil of that room.

OPPOSITION.

Naturally, opposition must be looked for on the part of the laity, and sometimes from the profession. Your motives will be misconstrued, and the very good that you are trying to do may be turned to your own disadvantage. So far as securing authority to do this work in the schools, or, what is better, in clinics established outside of the school building, sentiment has much changed. I endeavored to bring up the matter of securing permission merely to make the examination of the teeth in the public schools of Chicago in 1886, and wanted to bring the matter before the board of education. A member of the board, who felt kindly toward the project, with all kindness informed me that it would be unwise to bring up the matter, as "the board had no authority, right, or control over such matters." Nevertheless, by being acquainted with the principal and a number of the teachers of the school in my neighborhood, I did examine 286 children at that time. At the present time no school board will oppose either the examination or the actual work.

So far as the school teachers are concerned, in an extensive experience, in making examinations, and now in doing the actual work, I have—with one solitary exception—met not only with universal encouragement and support on the part of the teachers, but with such kindly interest that I cherish toward all of them a most heartfelt gratitude. The opposition on the part of some members of the profession is unimportant; no progressive dentist will oppose, and those who do oppose it are prompted by selfishness, jealousy, or other unworthy motive. I have met here, however, with serious opposition from the board of dental examiners—opposition which at one time almost threatened the abandonment of this entire work; and the situation is precarious at the present time, as all these clinics, except the one in the schools—and that lives by reason of the others—are conducted in violation of law, but at present under a provisional sanction, which may be terminated at any time. I have made repeated efforts since 1903 to have the law amended so that (at first) such clinics might be established, and (since 1905) when they were established, that they might continue—but without success. The board of dental examiners has not only fought the proposed amendment, but last November had the man, the only one who earns all the money with which until now nearly 5000 cases of charity have been attended to, arrested and fined twenty-five dollars as required by law. At the present time the assistant is in constant fear of being again arrested, and his work is not as cheerful and satisfactory to me as it otherwise might be. With the twenty-five dollars thus taken from the funds of the clinic I could give service to over 150 children (this is proved by the cost of the school clinic), doing emergency work and small fillings for them to the number of over 300. I apprehend that there is no state or territory of the United States where the

board of dental examiners would interfere with such work.

STATISTICS.

To give an idea how reasonably such work can be done, bearing in mind that my assistants have worked for exceedingly meager compensation, I herewith give a report of all receipts and expenditures. It should be remembered that the donations to the clinic are valued at about $900, that my own services are given without remuneration, and that the hospital gives quarters to the clinic free of rent.

FINANCIAL REPORT.

(In U. S. currency.)

Total receipts from all sources, $3169.08.

Disbursements:

Assistants' salaries	$1507.25
Materials purchased	999.70
Equipment purchased	293.70
Paid to St. Paul's Hospital	198.08
Fine of assistant	25.00
Goods and supplies in transit	52.00
Cash expenses for schools and orphans	56.00
Balance on hand	37.35
Total	$3169.08

Average monthly income	$51.95
" income per patient	0.5484
" expense per patient	0.5420
" income per operation	0.2205

The total income is received from one-sixth of those who patronize the clinic, so that the sum received from them enabled the clinic to do the work for them and to treat 4815 patients at the prison, the schools, orphanage, and the hospital free of charge.

The table opposite (operations) shows the grand total of all services rendered in these various clinics.

The following tables show the distribution of the patients in the various clinics, race, and sex:

Period of time covered—St. Paul's Hospital: May 1, 1905 to April 1, 1910. Bilibid Prison: June 22, 1906 to April 1, 1910. Public Schools: January 12–28, 1910, and February 16 to March 7, 1910. Girls' Orphanage: January 31 to February 15, 1910.

All records complete to April 1, 1910:

Sex.	Patients
Male	4069
Female	1709
Total	5778

Race.	
Filipino	5527
White	160
Mixed	36
Chinese	31
Japanese	20
Negro	3
Indian	1
Total	5778

Distribution of Patients.	
St. Paul's Hospital	4414
Bilibid Prison	906
Public Schools	385
Girls' Orphanage	73
Total	5778

I am of the opinion that no city in the United States can afford to rank below Manila, and I urge the members of the profession everywhere to undertake this work. In conclusion, I may say that the eventual aim of dentistry ought to be to so improve the dental condition of the human race that the great work and good now accomplished by the dental and the medical profession shall be only a memory and a bright page of history. In the meanwhile the mercenary view may be legitimately considered, and this affects dentists of the present and the future, the manufacturers of dental supplies, dental schools, and in fact all who directly or indirectly secure a financial gain from dentistry. It certainly cannot be denied that if, by the saving of children's lives and by the education of children, it should come to pass that no civilized person would think of existing without having his mouth and teeth in as perfect a condition as science can place it, unquestionably for a time there would have to be increased numbers of dentists

OPERATIONS.

——	Hospital.	Prison.	Schools.	Orphans.	Grand total.
Treatments	6,027	651	419	176	7,273
Extractions	4,300	463	7	2	4,772
Cement fillings	356	5	109	35	505
Gutta-percha fillings	325	2	50	3	380
Amalgam "	278	. .	403	103	784
Gold "	18	. .	. .	. .	18
Root "	1	. .	. .	. .	1
Cleaning cases	81	6	14	9	110
Vulcanite plates	89	4	. .	. .	93
Same, repaired	4	. .	. .	. .	4
Gold crowns	164	2	. .	. .	166
Porcelain crowns	56	1	. .	. .	57
Richmond "	4	. .	. .	. .	4
Bridges	145	4	. .	. .	149
Regulating cases	2	. .	. .	. .	2
Artificial noses	2	. .	. .	. .	2
" lower lip	1	. .	. .	. .	1
Total	11,853	1,138	1,002	328	14,321

graduated from the dental schools, and that there would be corresponding increase in the manufacture of dental supplies—followed in the far distant future by a decline, for prophylaxis and early care would prevent the doing of much that is now imperative. And surely a profession can have no higher aim than for humanity's sake to bring about such a consummation.

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(3) "Trans. American Dental Association," 1888, p. 176, and DENTAL COSMOS, January 1889, p. 15.

(4) "Trans. Fourth International Dental Congress," 1904, vol. ii, p. 71 (and summary in DENTAL COSMOS, March 1905, p. 356).

(5) DENTAL COSMOS, July 1908, p. 669.

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PROCEEDINGS OF SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, November 1909.

A REGULAR meeting of the New York Odontological Society was held at the Academy of Medicine, No. 17 West 43d street, New York city, on Tuesday evening, November 16, 1909.

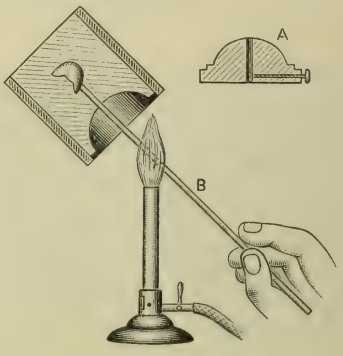
The president, Dr. W. D. Tracy, occupied the chair, and called the meeting to order.

INCIDENTS OF OFFICE PRACTICE.

Dr. W. A. HECKARD. I have here a glass spatula which was given to me by Dr. Maurice Albrecht of Indianapolis, Ind. He suggested this spatula to the profession more than ten years ago, and I have worn out several myself in the last six or seven years. Anyone may have them made. Dr. Albrecht does a considerable amount of work with artificial enamel, and claims that the secret of his splendid success is found chiefly in the use of a glass spatula and glass pluggers.

I wish also to show you a few inlay rings, and to clearly explain their use. Finding it sometimes very difficult to get the investment material properly on top and at the sides and bottom of the wax model—especially at the bottom—I divided the ring into three pieces of different sizes. A ring that is but one-third as high as the whole ring when assembled gives plenty of room to build up the investment material around the wax model. Then, after adding the next section of the ring, the rest of the investment is poured in. Even this did not meet the demands of all cases, and I next tried sprue wires of different lengths. Finally I drilled a hole clear through the sprue base (see Fig. 1, A), and put a set-screw at a right angle to it. This allows me not only to lengthen and shorten the sprue wire at will, but

FIG. 1.

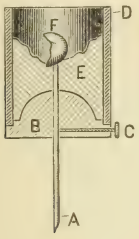


also, after the screw is loosened and the crucible-former is gently removed, to have a sprue six inches long that I may hold over the Bunsen burner and gently loosen with the fingers (B, Fig. 1) instead of taking hold of it with pliers. The fingers holding the sprue wire will give you warning of the heat that you are applying, and will enable you to turn the sprue wire out of the investment without so much danger of tearing the investment around the crucible. By using the long sprue wire and the sectional rings, we can invest many oblong cases, such as long clasps, pieces of bridge work, saddles, etc., in much less investment mate-

rial than would be required by any other method.

After mixing the investment to the proper consistence, I fill the ring about half full (see E, Fig. 2), and paint a

Fig. 2.



little investment all over the wax model, F, which is mounted on the six-inch sprue wire, A. In this way I have enough wire to enable me to pass one end down through the investment, find the hole in the crucible-former, B, and insert it until the wax model, F, comes in contact with the investment in the ring. I then tighten the set-screw that holds the sprue wire, and add investment in the ring, at the sides and on top of the wax model. This simplifies the work more than one would imagine without having tried it. I am indebted to Louis Weinstein for some of these suggestions, and for having these appliances made for me.

Dr. Tracy. Are any of these appliances on the market?

Dr. Heckard. No, they are not on the market, but anyone can make them.

The paper of the evening, entitled "The Surgical Treatment of Certain Malocclusions of the Jaw," was then read by W. Wayne Babcock, M.D., of Philadelphia.

[This paper is not printed by the Cosmos, inasmuch as in its essential features it was the same paper as that read by Dr. Babcock last October, at the meeting of the American Society of Orthodontists.]

After the discussion of the paper, a hearty vote of thanks was tendered to the essayist, and the meeting adjourned.

Anniversary Meeting, January 1910.

The forty-third anniversary meeting of the New York Odontological Society was held on Tuesday evening, January 18, 1910, at the Academy of Medicine, No. 17 West 43d st., New York city.

The president, Dr. W. D. Tracy, occupied the chair, and called the meeting to order.

Dr. Paul G. White of Boston, read the paper of the evening, which was entitled "The Practical Application of Oral Hygiene to the School Curriculum."

[This paper is printed in full at page 863 of this issue of the Cosmos.]

Discussion.

Dr. W. H. Allen. I should very much prefer to use the layman's privilege and ask questions of some of the professional men present, particularly of the official representatives of the dental societies, and let Dr. Cronin, of the department of health, and Dr. Crampton, of the department of education, discuss the matters which were brought out.

I think perhaps I can explain why it does not seem entirely absurd to a layman to be drawn into a discussion of this kind. It is the layman's appreciation of your ability that makes it possible for the dentists of the country to render their great services; for, be as active and progressive as you may as professional men, the measure at any particular time of your success will be the intelligence among the lay members of your community. Therefore it is from the point

of view of the layman, who pays the penalty of bad teeth and who appreciates the benefit of sound teeth, that I want to make a few remarks.

For several years I have been taking an interest in this question of dental hygiene. I started out with a very superficial and more or less emotional interest in this subject. During the last four or five years it has been my privilege to know intimately a number of members of your profession, and a number of medical men who have been taking up this question. Within the last forty-eight hours I have written to two multi-millionaires interested in philanthropy in general, in municipal research problems and other charitable problems, and, I hope, in dental problems. I wrote to one that I hoped history would say that the most important and fundamentally esthetic advance made in our day was the dental hygiene crusade.

I wrote to the other that for fifteen years it has been my business and privilege to understand the needs for practical philanthropy in America, and in spite of personal contact with many foreigners, the more carefully I have studied this subject the more I have become convinced that there is no proposition put up to the philanthropist in our time that carries with it more profound possibilities for uplift and health than the dental hygiene crusade.

If that qualifies me to associate with you for five or ten minutes, I should like to tell you the reasons for my convictions.

I emphasize the esthetic point of view, because the economic and humane are the strongest points that will appeal to the philanthropic layman. He cannot be interested in the differences between this or that school, but he is immediately susceptible to appeals to esthetics which confer an increased economic capacity, and to appeals for an interest in his suffering fellow men.

If we had a means of following the school child who learns for the first time what you can teach him—what Dr. White wants our children to be taught—with regard to clean teeth, we would, in my opinion, find that this child will have cleaner hands, cleaner shoes, and a cleaner body, a cleaner bed and a cleaner house, and he will acquire all this more quickly because of the new concepts, the new attractions and revulsions, for he will be brought to realize that the condition of his mouth is after all the index to his standards of cleanliness. I had to write some time ago, for laymen's reading, an article in regard to the teeth. I used the term "mouth garbage," which I suppose I plagiarized from some of you gentlemen. A woman protested against that term, because, she said, since hearing it, she spends all her time, when she is not otherwise engaged, in brushing her teeth. This shows that there is an element to which we can appeal in this crusade.

I will not go into the question of the economics or the earning capacity further than to recall the case of a man who in many ways has done much to vitalize and certainly humanize the layman's point of view, namely, Dr. Goler, who has done so much in Rochester in other ways—for instance, in regard to milk—to awaken us to matters of public health. I have seen children come to him for their "working papers." He has no right to refuse the papers because the child does not have clean teeth, but he says, "Johnnie, you have sixteen teeth that need attention. You have sixteen dirty teeth, and sixteen diseased teeth, and I will tell you something that you never thought of. Johnnie, you will work for $3 a week now, and if you don't attend to those teeth, in a few years from now all you will be earning is perhaps $6 a week. You are intended to be a handsome boy, and have your teeth come down solid, as if you had grit. Now see here, my boy: Go home and tell your mother she is wrong; she ought to have your teeth attended to. Tell her to have your teeth put in condition, and I will not only give you your working papers, but you will double your salary in a short time."

That is an appeal to the boy from the East side, or the South side, or the North side.

Besides the economics and the esthet-

ics of this subject, we have something that explains the general enthusiasm for dental hygiene, and which is one of the most extraordinary phenomena in the history of medicine and dentistry and practical health work, the awakening of the people inside of six years to a realization of the strategic importance of harnessing the school to help progress.

Dr. Cronin will not dare tell you—because it would not be professional—but for nearly a year, as chief medical inspector of the public schools of New York city, he did not dare breathe the fact that he was making a physical examination, and if he attempts to deny it I will prove what I say. Six years ago these things were so little understood by the leaders in our various professions that Dr. Cronin had to go in the dark in rendering a service to 50,000 or 60,000 children, for fear he would be stopped before he had made out a clear case. Think of what has come from that! Throughout this country today, state superintendents of education, who are responsible for 20,000,000 children, United States commissioners of education, the parochial schools, the reformatories, the state colleges and universities, in short, everyone interested in sanitary work, realize that a wave is coming that way, and that they must do something for the children. I have had correspondence with 520 cities. They all know that this movement is spreading. They want to know how they can persuade their communities to do their share. We must harness two great social agents, as Dr. White has pointed out tonight, our health departments and our school departments, to this crusade. They catch, coming or going, about 97 per cent. of 80,000,000 people.

There are half a dozen practical questions that need discussion, and I think some of them must be discussed from the standpoint of the layman's receptivity and susceptibility to teaching.

Dr. White raised the question of the curriculum. Is it not interesting to note that after twenty-five years of experience, showing that the text-book method of interesting boys and girls in hygiene has not been successful, we are yet so orthodox as to seriously consider as one of the ways to obtain results the forcing of chapters on dental hygiene into the curriculum?

The problem seems to be not so much one of introducing the systematic teaching of hygiene into the school, as to get the school authorities to realize that at the critical time, before the child is graduated before he receives his working papers, they can inforce the precepts—when they have the child by the throat, so to speak, when he must do as he is told. One intelligent examination of that child, by which bad teeth in his mouth are located, the child being sent to the dentist, or to his mother with instruction that he should see the dentist, is worth more than three years of systematic instruction as to why he should take care of his teeth. If this be correct, it materially affects the question of the next steps to be taken by the dental profession just now—whether a dentist is actually needed to tell a child to go to some other dentist, or whether he is to do dental work for the child;—whether the dentist should look at the child's mouth in school or in the dental office where he has the instruments to give the treatment needed. It seems to me that the latter is the more important.

Half a dozen things could possibly be done at once in this city. Dr. Cronin would meet you more than half-way in seeing that each of his examiners takes the kind of instruction which you would regard as the minimum necessary to understand the problem of examining a child. The teachers in normal schools would be very glad to have you render them that service. The normal schools could probably be induced to make it a condition of graduation, so that every teacher shall be not only absolutely convinced of the value and manner of this crusade, but shall leave the normal school practically pledged to carry on this crusade when she becomes a teacher.

Considering the small number of dentists and the necessity of their doing practical work, the proper procedure seems to be to touch the top notches,

and convince Dr. Cronin and Dr. Crampton, because if you can convince them in the right way, you will have all their assistants working in the right direction. It will require about all the energy that the dental profession can spare to educate the educators, and to set going these tremendous forces, representing nearly 600,000 teachers, counting the parochial and private schools.

The dental hygiene associations of this city can before the end of this working year practically get every general hospital in the city to introduce a consulting and attending dentist on an equal footing with the medical men. To educate the men who control the gateways of the hospitals and dispensaries is an infinitely more effective method than to work on a few thousand individual children who are not in a position to carry on the gospel.

I believe that it is possible for you, before the end of this year, to get the juvenile asylums—the New York Juvenile Asylum has taken up this work for three or four years—every fresh-air home, every philanthropic institution, to do their share. If you spend your time on these educators, you could, before this winter is over, get practically every one of them to say, We are joining in this crusade. We will follow your leadership, if you will show us how we can become the effective recipients of the leadership of the dental profession.

Another great opportunity for enlightenment is the examination of the children for working papers. About 25,000 children receive these papers every year. Dr. White has made an admirable suggestion that a chapter be written and made available—even if it were not used in the schools—to be distributed on that occasion among those children about to go out into industry. If such a pamphlet were prepared, the health department would go more than half-way, and would see that everyone who receives his certificate would obtain the necessary explanation of dental hygiene.

There are one or two other agencies of this kind that would be very glad to distribute information such as you can give, and if you spend your time as leaders in educating the leaders among laymen, you will engage the whole community in this work, and the same A B C will not have to be gone over again every year. The Brooklyn department of charities, the charities in New York, the United Hebrew Charities, will all be glad to join in such a movement. The Metropolitan Life Insurance Company has said, "Come one, come all—anyone who has a message of health for 15,000,000 people, and we will pay the bill for printing and distributing it."

Soon there will be large staffs of dentists to whom the people can be referred to carry on both the educational and the repair work. We have not even reached the A B C of this crusade, because, as Dr. White said, even if the number of dentists were multiplied by one hundred, they could not begin to do this work. The only way in which we can hope to accomplish results is by securing the cooperation of the agencies through which the laymen obtain their ideas. You, the few of you that are available in any community, who see and who know, will find all of your energies called for if you but concentrate your efforts on these men who can universalize that which you are so able to do and which you want to do, as evidenced by such addresses as that of Dr. White.

Dr. Cronin. I am glad indeed to discuss the paper of the evening, as I feel that it is a most important one from a sanitary and educational standpoint.

I regret to say that there seem to be as many systems of practical application as there are individuals advocating them. Therefore it seems necessary to co-ordinate all forces operating for the same objective, so that there will be no contrary action. In much the same way as the bureau of agriculture controls the various stages and factors of food products and enjoys prerogatives that cannot accrue to the individual states, so I believe that if there were a national bureau of personal hygiene, more good could be accomplished to the greatest number in the most efficacious manner.

There is great hope that in the near

future the care of school children will be fully controlled and these valuable assets conserved in the most perfect health possible for the parts they are destined to play by the fact of their birth.

There seems to be no question that something must be done at once to correct the unspeakable conditions of bad personal and environmental hygiene and sanitation.

The question I want to take up first is that of children being compelled to have their teeth attended to at the working-paper age. It is a crime against the intelligence of any civilized community that children grow up and pass the most important developmental periods of their existence harboring test tubes full of the most vicious and virulent germs in decayed teeth. Whatever conditions they may live in, they are made worse by the conditions of their mouths. Questions of pure food are of no concern whatever when food enters such a mouth. It is better to have a clean mouth and adulterated food than to have pure food and a filthy mouth.

The question as to how to overcome the existing evils in the most complete and expeditious way is a most important one.

The dental profession, as a force occupying a most important relation to the correction of certain bad conditions, should occupy the same position in regard to such corrections as do other special branches of medicine in regard to certain conditions of specialized medicine.

The detection and control of all personal hygiene should be under municipal control, and need not be under the control of representatives of special branches of medicine. Men trained in the supervision of public health of school children are or may easily be trained so that they can detect any deflections from the normal. When such cases are found they should be referred to those agents of special medicine who are best qualified to remedy the conditions—either the family physician, who can be trusted to dispose of the case to its own best interest, or to the family dentist.

The schools are inaugurated for the purpose of training the mind primarily, and secondarily to see that bodily health is maintained at such a standard that mental training is efficient.

The conduct of everything that pertains to the well-being of the child should have the school as its center, as its clearing-house. Anything arranged through the schools with the co-operation of the doctors begets a force and dignity for the work that otherwise would be impossible.

Refinement of diagnosis is not only not required, but would materially interfere with the prime object of schools. There is no more need of a dentist to discover whether a child is in need of dental care than there is for an oculist to demand that special work should be looked after by an oculist, aurists to look after the ear, nerve specialists to look after nervous diseases, alienists to look after psychiatry, orthopedists to look after the locomotive apparatus, dieticians to look after problems of malnutrition, and throat specialists to look after abnormalities of nose and throat. It affords a very ridiculous perspective to think of nine able-bodied specialists in line each waiting for his turn to examine a little squab of a school child in order that he may ascertain what that child needs with particular reference to his own specialty.

There can be no question, if such a system were feasible, that it would be ideal, but the detection of these various types of cases is all that is necessary. This sorting-out process by regular inspection of school children conserves a great deal of time for constructive work by agents of special medicine.

The supplementing of the work of detection of abnormalities by constructive action must result in thoroughly grounded knowledge in matters of personal hygiene. There is no element so contagious as the element of education, and in matters of personal hygiene education is seen in its most virulent form. I believe that there is sufficient personal pride in every intelligent human being to cause a desire to be as healthy

and physically beautiful as another. The school should be used to spread this gospel in a general way, and point out to the individual any special departures from the normal.

Although Dr. Allen seems to have stolen this idea from me, I agree with him perfectly as to that one object-lesson. Only today I went into a school and happened to see a child who had a fish-hook in the fundus of his mouth. The child was eight years old, and his first molar was completely gone. When I discovered the fish-hook I asked him how he got it there. He said that he had been playing horse with his brother last night. I showed it to the teacher, and that teacher is more interested now in the subject of oral hygiene than she ever was before. If you put before a teacher the record of an examination of the child, the chances are that she does not pay much attention to it; but if she finds something practical like this, it will interest her and hold her attention, and stimulate her to seek remedies for these neglected conditions.

When the child comes for its working certificate, it is too late for the fundamental work of developing the teeth and the dental arches. Many people say that the carious teeth are only deciduous ones, but when the question is put before them which is and which is not a deciduous tooth, they do not know. If they see one of the deciduous teeth, the second molar, decaying, they do not know whether the tooth immediately behind that, when the child is seven years old, is the second deciduous tooth or the first permanent tooth of the jaw.

Diagnosis and treatment of defects must be left for special persons and institutions, and only such treatments afforded in the school as conserve community health, as now accepted with regard to contagious conditions.

Where medical inspection is not considered properly, a field is offered for those specialists who desire to act as pioneers in the great humanitarian work of saving the child for the best there is in him. Let them here detect and treat cases.

In New York city the interest of the child is best conserved by competent persons doing constructive work. Let the detecting be done by others.

A "National Association of Physicians and Dentists" might possibly prevail upon some physicians and dentists in each town and city throughout the United States to grant some time each day to detection and correction of abnormalities. Show the good results of such educative work, and soon we will have a community that knows the value of good health (a consummation devoutly to be wished!), and this condition will remain as a perpetual monument of the devotion, intelligence, and unselfishness of the medical and dental professions in seeking the generous uplifting of their fellow men.

C. Ward Crampton, M.D. (director of physical training, New York public schools). It has given me exceedingly great pleasure to listen to the paper of the evening. As one of those charged with the duties of insuring strong and healthy bodies to the children of today and the men and women of the future, I note with pleasure the forceful presentation of the subject and the energetic program that is outlined. City officials in positions similar to mine cannot be experts in the matter of physical training, spinal curvature, eye-strain, ventilation, school light, desks and dumb-bells, without listening respectfully to the members of the medical profession whose duty it is to inform us.

The presentation of this subject as one of educational concern is most apropos. I am in the habit of referring to decayed teeth as being more dangerous to the health of the body than is the criminal to the city. Its dangers can only be likened to the moral infection resulting from a brothel in a village community. These dangers cannot be too often or too energetically presented to both educational and health authorities. My own observation in this matter may be recapitulated as relating to an investigation of the first-year boys of the high school of commerce in 1903, as follows:

*Condition of teeth of second-term boys.**

	Per cent.
Well cared for. In excellent condition...	2
One or two partly decayed. Some signs of care. In good condition.....	24
One wholly decayed and one or two partly decayed. In fair condition.....	27
Two wholly decayed and one partly decayed or three or four partly decayed. Little signs of care.....	22
Three wholly decayed. No signs of care. Mouth in poor condition.....	21
Four or more wholly decayed. Mouth in foul condition	3

In our high schools we have a well-ordered physical and medical examination conducted by the special teachers of physical training. Of the character of this service I can only state that it results in having something done—to wit, the tooth-brushes are used and the teeth are filled.

In the elementary schools, in which there are 650,000 pupils now registered, there is a scheme of medical inspection conducted by the department of health. This results in the discovery of decayed teeth and the notification of the parents, but whether results may be obtained I am not prepared to state. It may be sufficient to say, however, that from personal investigation there appear to be still thousands of children (often 70 per cent. of the class) who have decayed teeth unfilled and uncared for. There is, however, a course of study in hygiene conducted by the department of education.

Your speaker has regarded the teaching of hygiene in schools as a "sinister practical joke," and says that the present farce should be swept out of the schools and consigned to the junk-heap. I regret to say that at present it is impossible for me to controvert his statements, nor do I hold myself responsible, since it has been my pleasure to be in charge of this work but for one short year. I am glad to say, however, that I believe the teaching of hygiene should be brought wholly up to the practical methods of the day, and that oral hygiene should receive a very much larger share of attention than is given it at present. It appears to me that too much attention is being given to a consideration of the structure and function of the teeth, and too little attention is given to the structure and function of the tooth-brush. I feel that there is too much time wasted in the teaching of tooth-structure with the hope that knowledge of such structure will result in a proper appreciation of tooth function and tooth hygiene. The children of the schools are, as a mass, too young to base their practice and form habits wholly upon matters of consideration, but they will do what they are told to do if sufficient authority and common-sense reasons are given. Instruction in all but the higher grades must be entirely empirical and related to the practice of daily life, and should be wholly released from the considerations of structure.

I believe that we may look to the earnest and enlightened effort of the public-school teacher for the practical application of our theoretical knowledge. It seems to me advisable that every teacher should guard in a practical way the health conditions within the classroom. A hygienic inspection should be made every morning, and the mouths should be examined periodically. This will support the physician's inspection and lead to the getting of things done, rather than the mere doing of them.

I agree heartily with the suggestion that proper text-books should be provided. "We cannot expect to obtain bricks without straw," and the public-school teacher is but human. I have no doubt that this society would be the proper one not only to see that a good text-book is written, but to see that appropriate attention is given to the subject of oral hygiene and to all text-books to be published on the subject for school use.

I may call the attention of this society to the work done by the Health Education League of Boston. They have published a series of leaflets on matters of health, but I have looked in vain for one

* [This examination was probably superficial, and it shows the mouths of 73 per cent. of these to be badly in need of dental care.—Editor, N. Y. Odont. Society.]

dealing with oral hygiene. It may be that their missionary efforts may well be applied to this work. As the speaker of this evening comes from Boston, he might be in a position to execute the wishes of the society.

In closing, permit me to express my appreciation of the fact that there is a society of competent jurisdiction willing and anxious to co-operate vigorously with the general work of the school toward good health.

Dr. H. L. Wheeler. Let us look at this problem from the viewpoint of the dentist. We have some rocky roads and some ungraded steeps before we can bring about the results suggested this evening. I appreciate the courage required on the part of Dr. White to come here and attempt to lay out a plan by which a profession which is at the most sixty or seventy years of age may accomplish an object which it has taken the medical profession centuries to accomplish. The fact is, that up to the present time the only means we have of caring for those who need our services, who have unhygienic mouths, carious teeth, and various other troubles relating to the mouth, jaws, and teeth, is of a reparative nature. The only known preventive that will make any impression whatever is the intelligent care of the mouth and teeth by the individual himself. The task of training the public, both children and adults, to appreciate the necessity for constant attention to cleanliness, is a task so herculean that it will surely take not one generation, as has been suggested by Dr. White, but a good many, before we may begin to make sufficient impression to prevent a very large part of the dental profession from falling constantly into the depths of despair.

Several remarks have been made here tonight with which I desire to take issue. In the first place, the primary work of the dentist is not essentially one of esthetics. It is so to a large extent, to be sure, but probably the most efficacious way of getting the children in the schools interested in the hygiene of the mouth is the appeal to personal pride. After all, if the teeth play as important a part in the question of human health as we like to believe and as some dentists constantly assert that they do, there is something in the problem much more important than esthetics, namely, the question of efficiency. That question is one which comes back to a question of repair.

In a sense, America has lagged behind in this field of hygiene. We have read graphic accounts of what is being done in England. They have an excellent book over there, gotten up by Pedley and Harrison and others. We have an excellent one in America, which has become rather obsolete, however; it is the old White text-book.

I made a remarkable observation while abroad last summer. As is well known, the English control one-fifth of the earth's surface, and they are in a sense masters and leading men; and yet of all the people who neglect their teeth, rich and poor alike, who are regardless of whether they have a clean mouth or not, the English certainly take the premium, and in spite of that, they are in a sense the most energetic and practical race on the face of the earth, and their death-rate is not greater than it is with us.

On the other hand, Germany, which is a close second in bad teeth among her peasants and plain people, has attempted by her well-organized government to stem the tide by carrying on clinics in connection with the public schools. All of the practical useful work in mouth hygiene that has amounted to anything of consequence, as far as I have been able to observe, has been carried on in connection with the educational departments of the respective countries where this movement has spread. It has been done by the educational department which came in contact with the children; but in spite of the work done in Germany, it is astonishing how small a percentage can obtain attention.

Strassburg, which was the first city to establish a dental clinic, in 1885, by the efforts of Professor Jessen, has nearly 20,000 pupils in the public schools. Four chairs are reserved for these children, and the clinics occupy altogether

eight rooms. There are but two assistants and one manager, who is Professor Jessen. The assistants receive a salary, and do nothing else but attend to the children.

The city of Heidelberg, which has but 5000 school children, has one chair, one manager, and one municipal school dentist.

Charlottenburg, which has over 20,000 children, has but one dental clinic and one school dentist, with a superintendent who is not there constantly, and two chairs.

Berlin, with 225,000 children, has but two dentists working for the public schools, and they care only for the very destitute.

Frankfort-on-Main has two dentists for 36,000 children. The Rothschilds are building a magnificent dental clinic there as a gift to the city, with something like eight or ten rooms, yet so far there are but two dentists and one manager.

When you consider the work which Dr. Merritt has been doing for the Children's Aid Society here, carrying on clinics that have been of such value to us in teaching us some of the conditions that prevail, and when you realize that with all the dentists he has at his disposal, he is able to attend to but 500 or 600 children a year; further, that at Bellevue Hospital, with an average attendance of sixteen or seventeen dentists, so that two or three dentists are constantly present for two or three hours, less than 1200 annually can be attended to—then you may imagine how much two dentists can do among the 225,000 children in Berlin. Their service is practically *nil*. What little we can do here is also practically *nil*, unless the dental profession takes care of this movement through organized societies, and sees that it is not carried away by enthusiasts. At the present time the interest in this movement is becoming so great that Tom, Dick, and Harry, honest in their enthusiasm, desirous of serving the public, but with no experience or knowledge of the situation, are rushing into the work in such a way that soon we will not only have clinics with an organized department looking to it that only the deserving destitute receive dental service, but where as well the undeserving and well-enough-to-do persons will get work done which should go to dentists; and we shall then have a condition that will discredit our ability to carry out this work.

The difficulty is that there are only about one-hundredth enough dentists to carry on the work as suggested and accomplish anything, and if we attempt to do more than we can we shall go backward instead of forward.

The suggestion that has been made here tonight that because a child is taught to have clean teeth he will necessarily have a clean face and hands and body is not borne out by experience. It is said that the ancient Romans washed their bodies but never washed their clothes; from my observations in Rome this summer, the present Romans wash their clothes but not their bodies. The great Whistler is related to have met a child once who was in a very filthy condition, and to have said to him, "I say, boy, how old are you?" "Seven, sir." "Indeed!—it seems incredible so much dirt could have accumulated in seven years!"

I disagree also with Dr. Cronin, who says that he would rather have a clean mouth and adulterated food than a dirty mouth and pure food. I have sometimes thought similarly, but on the whole I would take my chances with the pure food. While it is absolutely desirable and necessary to avoid disease germs of all kinds, the fact remains that it is astonishing how many people will live among disease germs of every kind and yet remain healthy notwithstanding their surroundings.

The argument was used that there is no more need of a dentist than of eight or nine other specialists. The other specialists receive a medical education and are trained in every one of those branches; but name me a medical school in America, or any other country, which gives any training whatever in regard to the teeth and adjacent parts. I have yet to see a physician who is intelligently

trained to make a thorough examination of the mouth. I have many friends among the medical profession, but they are not trained for this—I will except Dr. Cronin, who has had experience in oral matters. Many of the physicians do not know whether it is a permanent or a deciduous tooth for the treatment of which they are sending a patient to us. With all due respect for the men who have carried out the examinations, I do not consider that the examinations made under the auspices of the bureau of child hygiene are worth the paper they are written on, and they never will be until they are made by competent dentists. When it is maintained that it is not necessary for competent dentists to do that, how shall we secure authoritative figures that will be accepted anywhere in order to draw comparisons? Ten or twenty years from now it will be necessary to look back and see what the average condition of the teeth of the children has been in a community at such a time, what the condition is today, and what the general physical condition has been.

It does not follow that because there is an enormous number of bad teeth there will be a great number of diseases. I think the percentage of illness in Germany is the least of any country in Europe, although the Germans have the worst teeth, next to the English.

Bad teeth surely act as a drag and lower the vitality of the individual, but when we maintain that about 50 per cent. or 75 per cent. of the ills of the public schools would be done away with if the children had clean teeth we are slightly exaggerating. It will take statistics compiled for years, filed away and carefully compared, to see whether we are right or wrong.

My argument tonight is simply this: Let us go at this work with determination and steadiness in all its phases. The work done by the Children's Aid clinics and by the hospitals is most praiseworthy. Dr. Tracy's work fills another want; that clinic, if it could be multiplied by forty, would be most useful.

I have but one criticism: the work we are doing now we are not doing for the present. We are hoping to build it on a foundation on which it will grow into usefulness for the public and the glory and reputation of the dentists; and in order to do that, we must so build that none of these institutions will be individual institutions. We must so build that they will be in the hands of the profession, and that the profession will feel they are their property and not the property of any individual. It is necessary in the beginning for the individual to take hold of this movement, but in the long run, if these institutions are to be permanent they must be arranged like all other organizations, namely, so that they shall be the property of the whole profession.

Dr. A. H. Merritt. If this work for which we stand is ever to succeed, it must be done by the dentists. Unless you who are here tonight are willing to engage in the work which we believe ought to be done, it cannot be carried out successfully. Unless we as members of the dental profession are willing to perform our part, though we may have the co-operation of all the organizations of the world, this work will not bear fruit.

No one doubts the desirability of educating the public in matters of mouth hygiene as outlined by the essayist, but this is not a panacea for all the dental ills which the human family is subject to. Mouth hygiene as practiced by the average school child is of such a character that it cannot be hoped that the amount of caries will be reduced except by a very small percentage. The child is bound to require dental services, and there are countless thousands of children whose parents are unable to pay for such treatment.

The education of the public as to their need of dental treatment has already created a demand which exceeds the supply of dentists who are willing to aid in caring for the needy poor. I wish everyone here might spend one afternoon a month in some of the dental dispensaries in this city, and see the people

who apply there. In the case of not one of these patients is there any question of a just claim to free treatment, yet many have to be turned away because they cannot be cared for. If we are to do anything in the way of educating the public, hand-in-hand with it must go an organized effort by the dental profession to meet their need.

As further evidence that the education of the public in this respect has exceeded the supply; note the fact that the Children's Aid Society, which ministers to over 12,000 children not one of whom is able to pay for dental services, has offered to equip and maintain free clinics in all their schools, and today, though that offer was made public a year ago, we are not able to care for 1000 of these children, owing to the lack of dentists who are willing to serve in such clinics. Until we are able to do something to meet this need, all this discussion of dental inspection in the schools is useless. What difference does it make whether the percentage of children with carious teeth is 65 per cent. or 95 per cent., when with our present facilities we are unable to care for 1 per cent.? I realize quite as fully as anyone present that the dentist cannot give his services like the physician, but that does not absolve him from doing his part. If this work is to be accomplished, it must be done by the dentist. It is unfortunate that there should be a division of opinion as to just how it should be done, but I believe that any effort which has for its object the caring for the children of the deserving poor, whether it be under the control of this or that organization, is a worthy undertaking and deserves the support of every right-minded member of the profession.

Dr. M. L. Rhein. There is one phase of this question that I should like to comment on. I have defined my position in regard to this subject on a number of public occasions precisely in the same manner as the essayist, that is to say, I emphasized the superior value of instilling the doctrine of oral hygiene into the school children rather than the attempts at constructive work. I believe that the whole secret of accomplishing what the essayist has so well delineated to us lies in carrying out a plan founded on that idea. It has been practically shown by statistics that the prevention of caries in the mouth is possible if the oral hygiene is carried out in an efficient manner from an early enough age. Dr. Allen has directed our attention to the utilization of the opportunity given to influence the child, or the boy, when he is leaving school. This idea is wrong. The habit of oral hygiene must be instilled in the kindergarten to start with, that is, at the very earliest age, if we wish to obtain the desired results.

We are endeavoring to demonstrate the value of this beneficent work to the lowest strata of civilization. This is an impossibility, unless the value of this work is properly realized by what we might term the upper strata, but what portion of these strata realizes this fact? Just that portion which is properly educated by the dentists who serve them.

I come back to Dr. Allen's remark that the value of dentistry is dependent on its valuation by the laity. The laity's valuation of dentistry is just that which the dentist educates the laity to place upon it.

In the upper strata I have met with a most unfortunate rebuff in my efforts to have the work of oral hygiene carried out by school boys in the large preparatory schools for college, recruited from the wealthier classes. The well-nigh impossibility of inducing these boys to carry out the principles of oral hygiene is almost incredible. Letters to the heads of these schools produce no effect at all. How, then, can we expect to use the power of the central government, be it municipal or state, if the children of the better classes are absolutely interferred with in the instructions that are given to them?

Dr. Wheeler spoke of the inadequacy of the dental service in the large German cities, and cites a certain species of statistics. This to me has always been more or less a joke, because I have found that people, if they are poor, are not necessarily desirous of being the recipients of

charity. We all know that the moment a person will accept something for nothing, he loses a vital part of his manhood, and there are many of the poorer classes of people who refrain from receiving free service, whether it be given in an infirmary or anywhere else. The fact that there are 25,000 school children in the public schools of a German city is no indication that a large proportion of them are not able and willing to pay for their dental services, rather than to accept charity from the municipal government. This to my mind is a weak point in Dr. Wheeler's argument.

In order to carry out the principles of oral hygiene properly, something more is required than the work of the individual himself. The simple instruction of the child or the adult, in an age of civilization such as this, and with our present foodstuffs, is not sufficient in itself to bring about oral conditions that can be called hygienic. In other words, the work of the prophylactic operator, as it were, is required in conjunction with the individual himself, yet the impossibility of furnishing by our available methods such work not only to the school children, not only to the substrata of civilization, but to the people who can afford it and are willing to take it if it is pointed out to them, is apparent and has long been apparent to every dentist in actual practice. Eight or nine years ago, I presented to the state society of this state, and to the American Medical Association, a plan by which these services could be rendered to the patients who are wealthy, willing to pay for proper dental service, and appreciate it. The work of a prophylactic operator need not necessarily rest in the hands of a graduate dentist; I am not referring now to diseased tissue —I refer to what is known as prophylactic work, and that could be intrusted to the hands of a trained dental nurse, as I choose to call such a helper. The demand for such nurses throughout the civilized world is very great. I know this to be a fact, because of the hundreds of letters which I have received from all over the world in the past five or six years from dentists who inquired whether I could furnish them with nurses of this kind.

There is a practical way of handling the children in the schools, at the same time furnishing the world at large with men and woman specially trained to do this work. A training school for nurses of this kind would be one of the most beneficent institutions imaginable, and these nurses would get their material to practice on from the public-school children just at the early ages when oral prophylaxis is needed most.

That is the only way to instil the doctrine of oral hygiene into school children at an early age—to have a trained prophylactic operator demonstrate in their mouths the value of these services. Establish a school of this kind, and it will perform a double object. It will give the service that is really wanted, not a constructive reparative service, but a real teaching in oral hygiene to the child, and it will give to the world at large a class of trained nurses who have a vocation before them that is unbounded in the number of places that can be filled.

This, I am personally convinced, is the only way in which this movement will eventually be rendered effective.

Dr. T. P. Hyatt. I believe that Dr. Allen was absolutely right in remarking that every person educated to appreciate the condition of a clean mouth is going to apply the same principle of cleanliness to other parts of the body and to his environment. I believe that any person who is educated to appreciate art in any of its higher forms is not satisfied to live in an unrefined way.

It is somewhat discouraging to hear it stated that we cannot take care of the whole 100 per cent. of the children who need attention. We cannot in the beginning, but we are not even taking care of 1 per cent., and we ought to take charge of this 1 per cent. to start with.

As to the question of clean food and dirty mouths, or unclean food and clean mouths, I do not think anyone will ques-

tion the statement that pure, wholesome food is best, and that we should strive in every way to get pure, clean food for the consumption of all persons, young as well as old.

There can be no question that a clean mouth is better than a dirty mouth. If there is anything we can do to bring about a more general appreciation of oral cleanliness we should do it.

I cannot understand the pessimistic remarks made tonight, particularly when a man has been interested in this work for six years and has seen the improvement that has come from the work of a few enthusiasts, and the enthusiasm that they have been able to awaken over the whole country. I believe I was the first dentist of any society in New York to give a public lecture in the public schools. I stated in season and out of season that the people are anxious to learn. The spreading of this movement throughout the United States is most encouraging, and it is splendid to see the laity trying to get practical philanthropists interested.

In regard to England and Germany and the bad teeth of their people, do you realize that the most intelligent and civilized people are the high-class Brahmins of India? We may be very proud of ourselves, but in regard to intellectual ability and skill, the high-class Brahmins stand head and shoulders above us; with them, the cleaning of the teeth is a part of their religion. The English, too, are beginning to realize that the teeth of the nation are becoming worse, and that something must be done to stop it. Their teeth have not always been so bad; they used to be much better, and why? Because they are living a very different kind of life from what they did years ago. All we have to do now is to take food into our mouths, and let our stomachs do the rest. You all know that if we do not use the teeth nature will get rid of them. It may be that we shall have to get rid of these foods that only need to be swallowed, and to again introduce the kind of food which must be chewed. The teeth of the civilized world are not as good as they were, because of the changed conditions of living, and we must meet those conditions by a better prophylactic care of the mouth. I believe most sincerely that the mouth is a source of health. I may be one of those persons classed as enthusiasts. I receive my information from the medical journals, and I quote them in every way possible. Temporary insanity and temporary paralysis, for instance, have been traced to diseased conditions of the mouth and teeth, and have been cured when the mouth was put into proper condition. I have heard of a man who was in an insane asylum for nine months, until a dentist discovered that his mouth was the cause of his trouble, and when his mouth was put into a hygienic condition he became well again.

I know, from my own experience, of a lady who had spasmodic contraction of the throat for four months, and she had dwindled down from 220 to 60 pounds. The trouble was of dental origin, and the removal of the cause cured that condition.

Are those things true, or not? If they are true, these are conditions of the body that can be remedied by a change in the condition of the teeth. If the child's teeth are kept in perfect condition, or in better condition than they are now, we shall not need the army of nine specialists waiting for the child. We shall only need one specialist. I do not want to deprive the other specialists of a livelihood; they will get their chance when the child leaves school, because they may be living under conditions that will bring about other conditions; but we shall not need so many specialists if the mouth is kept in a better condition than it is today.

Dr. Agen. I came here to learn just what was the latest idea, the best way of accomplishing something with children's teeth. I supposed that this body of men was unanimous in that question. I do not see how anybody, a dentist, or layman, or physician, can question the fact that the cleanliness of the teeth from early childhood on will prevent dental

caries to a very large extent. Of course, diseases of all kinds arise in spite of the best care. Some children are weak and have deformities in spite of the best care, but that does not change the fact that children should be protected from any kind of infection, and a dirty mouth being a source of infection, we should protect them therefrom.

I should like to know how we shall obtain the best results, considering the present attitude of the dental profession. How are we going to have the teeth of the small children who are in our schools or institutions taken care of, if there are no dentists who are willing to do that kind of charity work? In one of the institutions I have charge of there are about eighty children from two to fifteen years of age, and many of them are in very serious need of dental attention; but I do not know how to secure dental service for them. There is no dental clinic in Brooklyn except the one with which I am connected, where teeth are extracted, and I do not like to send children there if it can be avoided.

I would like to know if we cannot find dentists, younger men perhaps, who can find a little time to do prophylactic and conservative work.

Dr. G. A. Mills. I published in 1866 my thoughts on cleaning teeth, emphasizing all that Dr. D. D. Smith emphasizes, except what he brought out in his valuable circular in regard to the prophylactic part.

It is to the credit of the Brooklyn Dental Society that an institution was established in Brooklyn and supported by the city at $1500 a year, for about seven or eight years.

As Dr. Tracy has said, we need more interest in this matter—we need compassion for these people.

I have listened to all that has been said here tonight with the most intense interest, and I have not had the thought that there was anything but harmony. Every man has expressed his deepest conviction, and there have been a variety of aspects of the case presented. Every man has contributed something of value to our future as dentists. The constructive work is the basis of this whole movement, but individuals and organizations must be aroused to an interest in it. The points brought out here are in keeping with the whole subject presented. It was a pleasure to me to listen to the remarks as to the prospect, and I have been thinking of the older men, Atkinson and Taft and all the others we knew —how they would rejoice in the prospect which is offered by the agitation over a subject like this.

I would go back farther than the various speakers of this evening. I would go back to infantile dentistry. The time will come when the teeth will be taken care of before they have erupted.

Dr. White (closing the discussion). The discussion of this paper has been of great interest to me. I know that I have derived a great deal of good from it, as I am sure you all have. Yet I am sorry the discussion did not follow the trend of the paper more closely. We know, because we have been told time and time again, that an unhealthy condition of the mouth involves an aggravation of almost every disease to which mankind is heir; there is hardly any necessity of going into this over and over again at all our meetings. In my paper I tried to bring out the only three practical methods of instruction in oral hygiene in the schools, and in the absence of any argument discrediting or not indorsing those three methods, I shall have to accept my own methods as the best that have been suggested yet.

Dr. Dunning. I wish to offer a very hearty vote of thanks to Dr. White for his interesting paper, and also to our guests for their valuable contributions to this subject.

The motion was carried.

Adjournment.

Frederick C. Kemple, D.D.S.,
Editor N. Y. Odont. Soc.

Monthly Meeting, February 1910.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, February 15, 1910, at the Academy of Medicine, No. 17 West 43d st., New York city.

The president, Dr. W. D. Tracy, occupied the chair and called the meeting to order.

The paper of the evening, entitled "Prophylaxis as a Special Field of Work in Dentistry," was read by Dr. EDWARD B. SPALDING of Detroit, Mich.

Dr. SPALDING. When your secretary honored me with an invitation to read a paper on a special field of work in dentistry, either porcelain or prophylaxis, my first impulse was to decline. I felt that some of the newer processes which had recently come up, and the extreme to which porcelain had been advocated by a number of the men in our profession, had caused the pendulum of interest to swing away from that subject, and therefore I was loath to deal with the subject of porcelain. In considering the work of oral prophylaxis, when I realized that I had not been personally working in that field—that is, not doing the work myself—for over three years, I thought I could not offer you anything with reference to the detailed treatment. In 1904, Dr. Rogers became associated with me, and we took up this work, devoting our whole time to it, and we decided to put it on as dignified and solid a working basis as possible; I therefore decided to present to you this paper as bringing forth some of the principles of how we established oral prophylaxis, and our methods and ideas on the subject, although not the details of the work—which may be disappointing to some.

Dr. Spalding then read his paper, as follows:

ORAL PROPHYLAXIS AS A SPECIAL FIELD OF WORK IN DENTISTRY.

In this age of advancement in the science of health and the prevention of disease, dentistry is not merely marking time. The work of dentists among the school children of the country will be productive of benefit to the present as well as to future generations to an extent not possible to estimate, and the concerted movement of popular education regarding the importance of the teeth, which is being started through numerous channels, threatens to overwhelm the dentist in all localities with demands upon his time.

Whatever the demand may be, the profession was never better equipped to meet it than now. Skilled mechanical operations upon the teeth have been so perfected that the ravages of caries seldom if ever make the extraction of a tooth necessary. The restoration of the crown of a tooth in whole or part has been considered not only from the standpoint of usefulness and durability, but we are making an effort to imitate nature in form and color, and the term artist is now no misnomer when applied to a dentist.

The restoration of a tooth in porcelain so as to bring out the little peculiarities presented in its neighbors, thus so closely imitating nature as to deceive the eye, is not accomplished, however, without long practice and attention to minute detail. This exacting price demanded by porcelain of its followers is willingly paid by many of our profession; yet, I am sorry to say, very many others have dropped it in exchange for some easier road to "fame and fortune." Porcelain is only one of many branches of our profession today which requires much thought and patience on the part of the operator to practice it successfully, yet

we do not become faint-hearted as these new and complicated mechanical processes are presented to us; but, as in other walks of life, those in the vanguard are destined to become fewer as the hills grow steeper. There is, however, one branch of dentistry the technique of which is more exacting than any other, is less understood than any other, and the neglect of which results in the loss of more teeth than all other causes combined. For the sake of a better term we call this branch "oral prophylaxis."

Dr. D. D. Smith had a certain ideal in mind when he decided upon the term "oral prophylaxis." He was looking forward to the time when patients with healthy mouths will come to their dentists, not to have pain allayed, teeth extracted, or lost tooth structure artificially restored, but to have treatment which will prevent the need for such services. True prophylaxis is entirely preventive treatment. However, at present we use the term to signify the halting of destructive influences in the tissues surrounding the teeth, the curing of the disease in them, the prevention of its return, and the prevention of caries. Nevertheless, many years will pass before the oral prophylaxis specialist will be able to devote his entire time to prophylaxis in the strict sense of the term. Today the greater portion of his time is spent in curing unhealthy conditions, in restoring to comfort and usefulness teeth with impaired function due to neglect, and in educating the people to a keen appreciation of mouth health and the value of their teeth. It is a sad fact that this work will not be generally accepted and adopted by our profession until we are driven to it. The time is near at hand, and even now is upon us, when we will be forced into the work by the demands of our patients.

One prominent dentist recently disclosed his own uneasy state of mind by exclaiming, "Oh, this prophylaxis business is getting on my nerves—scarcely a patient comes into my office without asking questions about it!" Still another man, of national reputation, when asked by a patient, who had received treatment, for a continuation of the work, said, "You do not need any treatment; your mouth is all right; prophylaxis is simply a fad of the West."

Just why oral prophylaxis has not been and is not practiced universally by the profession is rather difficult of explanation, but I will endeavor to give some reasons why it is not.

For many years there have been undoubtedly isolated instances of dentists who have treated and cured pyorrhea, and yet their secret, if we may so term it, has not been learned by others of the profession. Had Dr. Riggs been told that after seventy years from the time he first demonstrated that pyorrhea could be cured the profession would still be skeptical about its successful local treatment, I am sure he would have been discouraged indeed. Undoubtedly, ignorance of the fact that it can be cured is the principal reason that so many men, when they see a case of pyorrhea, shake their heads and say to the patient, "You have pyorrhea and will lose your teeth before long"—not welcome news to the sufferer, to say the least.

Is this unconcern, this doubt on the part of the general practitioner of dentistry, due to the secretiveness of those who are doing successful work in this branch, or is it the fault of the general practitioner himself—that he does not wish to inform himself upon the subject? I think it is not the former, for the criticism usually accorded the worker in oral prophylaxis is that he is disagreeably enthusiastic, and wishes to convert everyone with whom he comes in contact. Articles on the treatment of pyorrhea and prophylaxis are now appearing in almost every issue of our journals, and yet, like most good sermons, they are taken as if intended for the "other fellow." Let a new idea in any line of mechanical work be advanced, and there are always plenty of men who are willing and eager to prove its value. At almost every dental meeting today, one or more clinics on oral prophylaxis and the treatment of pyorrhea are given, yet how many men are really attracted to

them? Very few, certainly, compared with the interest shown in the other branches of work.

Surely it seems, if there is a fault, that the blame lies with the general practitioner, that either he does not wish to know about the subject, or else he cannot see any need for informing himself. His eye has not been trained to recognize pyorrhea in its earlier stages, and when a tooth is "on its last legs," so to speak, it is much easier to extract it and make a bridge than put any thought on the subject of cure, with which he is not familiar. There probably is another reason why he does not wish to know about this subject, and that is because he confounds the term with the disagreeable operation of "cleaning teeth"—nor do I blame him.

"Cleaning teeth"—a disgusting term to be found in the phraseology of a learned profession, when applied to a service rendered by one of its members. As long as we as dentists continue to use this term as denoting a part of our services, and allow our patients to ask us to clean their teeth, so long shall we fail to receive that full dignity which our profession deserves. To just that extent are we looked upon to render a service on a par with that of the masseur and the manicure.

The operation of "cleaning teeth," as generally accepted, consists in the removal of visible deposits, executed more or less thoroughly according to the conscience of the operator. Probably some of the salivary tartar is taken off the teeth by means of two or three inadequate scalers, and then with a brush wheel in the engine the patient is pretty generally sprinkled with powdered pumice, his gums are considerably denuded of their mucous membrane, and *some* of the stains are removed from the teeth. All this is done in a hurry, because the operation is very distasteful to the dentist, and he is anxious to get at another patient and do work for which he can charge a better fee. Work without a knowledge of what one is doing, without an end or result to accomplish except to get rid of it, is drudgery—and such is "cleaning teeth," as generally accepted.

What has been accomplished by this operation? Very little good, for the patient's gums are so sore that he dare not use his tooth-brush for two or three days, and at the end of that time the soft deposits are again so thick on the teeth that fermentation and putrefaction is going on at almost the same rate as before the teeth were "cleaned." What instruction did the patient receive? He was told to buy a tooth-brush and some paste at the drug store, and be careful to have the bristles of the brush soft, and not use a tooth-powder, or else he would wear his enamel and hurt his gums.

The result is that the patient forgets to buy the brush and paste and knows no more about the correct care of his mouth than he did before, and thus goes on in the same old rut. Tartar continues to form and collect on the enamel surfaces that are not subjected to severe friction in mastication, because these surfaces have not been polished in the "cleaning" process, and soft fermenting deposits not being removed by the patient with the brush continue to irritate the gums, and next year when he goes to have a sensitive cavity under the filthy deposits on the buccal surface of his upper molar filled, the dentist says, "Your gums are very much inflamed, and it looks as though you were going to have pyorrhea."

I have not drawn this picture to deride dentists or dentistry, for if there is any profession whose members are hard-working and earn their few dollars by the sweat of their brows and at the expense of their health, and have scant credit for it, it is dentistry. I do wish, however, to draw such a comparison between this matter of "cleaning teeth" and the broad subject of oral prophylaxis that none may fail to see it, and that some who have not appreciated its value before will take it up and prove it for themselves. Let me say here that "cleaning teeth" is not oral prophylaxis, neither is oral prophylaxis "cleaning teeth."

Removal of deposits is to oral prophy-

laxis what removal of decay is to filling teeth—an incident. Time was when filling a tooth consisted in gouging out decay and stuffing the hole, with little and probably in most instances no thought to cavity formation, no consideration of the direction of stress, self-retention, line of immunity for the border, the direction of the enamel rods at the margin of the cavity, protection of the pulp from thermal changes, restoration of contour and interdental space, and last but by no means least, the comfort of the patient during the operation. All these considerations the modern dentist bears constantly in mind, and the removal of the decay has taken place while he has been working out the more complex problems.

Twisting wires and moving teeth is not orthodontia, neither is orthodontia simply moving teeth, yet the orthodontist does twist wires and move teeth.

In oral prophylaxis deposits of all kinds, visible and invisible, must be removed from the teeth, and not be allowed to collect for any length of time again, but it is not the business of the operator to remove visible deposits at each treatment of a patient. His work is to put all the teeth in such a condition that the patient can keep off all visible and many invisible deposits, and to so instruct and insist that the patient will not fail to do his part.

I maintain that if a patient has been given specific instructions in the care of his own teeth, and is using the necessary implements suited for his case, it is possible for him to keep his teeth absolutely free from visible deposits, providing the soft tissues immediately surrounding the teeth be in a state of health, the exposed tooth surfaces in a highly polished condition, and the artificial work, if any, be of proper contour and finish. Do I hear someone say, "Oh, you are painting an ideal condition?" Yes, but it *is* possible. I do not believe that this is a condition that will be found in many patients treated by a general practitioner, but it can be found in the mouths of many of the patients of those dentists who are devoting their entire time to this work.

The operator's first duty is to make a complete change of the environment of the teeth by removing all extraneous deposits of whatever nature from the exposed and free surfaces, and then to treat and cure pyorrheal conditions, which is entirely possible by definite and delicate surgical procedure. By pyorrheal conditions I mean any destruction going on in the peridental tissues due to inflammation. Probably a better and more comprehensive term is one used by N. S. Hoff, *i.e.* "peridentitis." These conditions are of many grades and degrees of advancement, from a simple gingivitis to that which involves the entire pericementum and alveolus.

That these conditions are all benefited, and the majority of them cured by local treatment alone seems incredible to the most of our profession, because they have so long looked upon them as being hopeless, and both the profession and the suffering public have been waiting for the discovery of some systemic treatment to come to their relief. Local treatment seems too simple to the dentist, for he usually feels that he has tried it many times and has only succeeded in giving a little temporary relief. Careful, thorough, and skilful instrumentation is necessary in order to remove every particle of the necrotic layer on the cementum, the necrotic edge of the pericementum, as well as the serumal calculus in cases in advanced stages, and that is no simple matter, to be done by two or three incorrectly shaped instruments in a hand not previously trained for the work; neither can it be done in a few brief minutes. Time is a necessary factor in the treatment, and hurry will abort success.

Today the work of the oral prophylaxis specialist consists in placing the mouth of each patient who presents himself, in a state of perfect comfort and health, the treatment of preference depending upon conditions involved. He places the exposed tooth surfaces in such a highly polished state that the patient will be able to recognize and remove any deposits, hard or soft, which might begin to form. He studies each case with ref-

erence to the patient's personal care, and instructs specifically and individually each patient, prescribing the brushes, floss, tooth-powder, mouth-wash, method of massage, etc., adapted to his particular case. Poor artificial work should be replaced with the best that dentistry has to offer. Then, last but not least, the patient is told about true oral prophylaxis, and systematic and regular treatment is advised. He is taught that his teeth should serve him through life and his mouth remain in the state of health and comfort to which it has been restored.

It is necessary for the operator to have a clear picture in his mind of the anatomy of the roots of the different teeth and their surroundings. He must have a delicate and highly developed sense of touch, as at least three-fourths of his work is dependent upon it, and he must have the ability to see with his fingers where the eye cannot penetrate. He must be a careful, considerate, and patient operator while also being thorough, as the treatment given may be mild or painful accordingly as he is skilful. His instruments must be many and varied to meet the requirements in reaching and successfully treating the different surfaces of the teeth.

The worker in oral prophylaxis realizes that he cannot arrive at successful results without the co-operation of the patient, and that providing he does cure peridentitis, like other diseases it will not remain cured if subjected to the irritations and influences which brought it on originally. Therefore the education of the patient, and the establishing of new habits in personal care is of the greatest importance. When brought to realize that it is necessary, patients will follow instruction and become very proficient in the removal of the visible deposits on and about their teeth.

But I hear someone ask, "Why is it necessary to see your patients at regular intervals after their mouths are healthy and if they are able to care for their teeth so efficiently?" The answer to this is a long story, but may be summed up in these few words: That it is then, and then only, that true oral prophylaxis begins. The patients then come to us for the constant watching and guarding of the oral cavity against the entrance of anything which may in any way impair the usefulness, durability, comfort, or beauty of the dental organs.

The operator must be keen in detecting incipient caries as well as any abnormal conditions of the soft tissues or of the teeth themselves. At each treatment every exposed tooth surface is carefully freed from all invisible substances in the form of bacterial plaques, mucoid coatings, etc. The tissues immediately surrounding the teeth are stimulated by vigorous massage administered by the operator. The patient is criticized or encouraged as he deserves, and in this way his interest in the welfare of his own mouth does not have occasion to weaken.

There are a great many people who, without any education by the dentist, do so appreciate and value their teeth that, when they learn about oral prophylaxis, they will have it at any cost, and there are many more people who need only to be shown the benefits of a healthy condition of the mouth to demand it also. Every dentist is constantly asked by patients for some means of relief from uncomfortable mouths, and from the destruction which they are themselves aware of as going on in the tissues surrounding their teeth.

My experience in and observation of this work leads me to believe that all destructive inflammatory disease, in all but a very small percentage of cases, can be cured, though the retention of teeth may not always be practicable in cases where there has been much absorption, even if it be possible to bring about a cessation of the inflammation.

While, of course, a few years' experience in the work does not justify a person's making positive statements of what can be accomplished by keeping a patient under regular treatment for a long period of time, yet I am convinced that, if a child be placed under treatment before the permanent teeth erupt, it is possible for him to arrive at the age

of twenty years or more without the loss of a single permanent tooth, and with very few, if any, fillings being necessary, with his gums in the condition of perfect health and with a knowledge of the importance and value of his teeth and their relation to general health; he also will have established correct habits in the care of his teeth which will be invaluable throughout life. If this be possible, I will leave you to consider the advantage to the individual.

If there be virtue in this treatment of the mouth tissues, surely we cannot close our eyes to the great need for it in every dentist's practice, and I wish to make a plea for its adoption. Its value is being proved by an increasing number of the profession, and I know of but one instance of anyone taking up the work, if he has made a serious business of it, who has not become very enthusiastic in it. Enthusiasm comes not with defeat, nor even partial failure, but with success; it is so with the worker in this field of dentistry—and not only the operator but the patients are equally enthusiastic.

I have in mind nine dentists who have given up general practice to devote their entire time to prophylaxis, and they were successful in general practice, too, and not failures—for a man who has been a failure in the general practice of dentistry will not make a success as a specialist in oral prophylaxis. I have talked with six of these nine, and all have said that they have no desire to return to general practice. A number of others, some of the best and most successful men in our profession, have stated that, were they in a position to choose, they would devote their entire time to prophylaxis. There is another man, in your great state of New York, a credit to the dental profession, who is now dividing his time between general practice and prophylaxis, but who will soon undoubtedly be in a position to devote his entire time to oral prophylaxis.

Surely this must have some weight in an argument for the importance of the work. Yet I feel that any amount of argument will not be so convincing to a dentist as will be the successful personal treatment of a simple case. It is not enough to inspect a well-treated mouth—for it is like viewing a work of art, unless the one viewing it has made a study of that particular branch of art he does not grasp all its beauties. If an operator has brought an unhealthy mouth through all these stages to a state of health in all its tissues, he sees more in it than can anyone who first views the case cured. There is a charm in this work which it is hard for the inexperienced to realize.

It will undoubtedly be years before the profession as a whole will grasp the full significance of this work, yet the time is fast approaching, in fact is here, when the progressive men who wish to give their patients the best that dentistry affords in every branch will have to study this work and learn its technique, or become associated with a specialist in it, or else refer their patients to a specialist. I believe that the work will seldom if ever approach a state of perfection at the hands of a dentist engaged in other lines of work. It is too complicated to be interspersed with problems of another nature, and the manipulative technique is so exacting that one soon loses expertness unless he is constantly at it, and he will not have the necessary control over patients under treatment. Even though a dentist be a graduate orthodontist, if he continues in general practice I doubt whether he is able to carry the work to as great a degree of proficiency as the specialist. Probably few dentists practiced orthodontia twenty years ago who obtained results perfectly satisfactory to themselves or their patients, to say nothing of what would be thought of those results today. The subject was too little understood until men devoted their whole time and thought to it, and today the more the general practitioner knows about orthodontia, the more entirely he lets it alone and leaves it to a specialist.

Almost every operation which a dentist did even ten years ago has been so improved by later and more scientific ideas that the improvements are

more difficult to master than the original operation was. We are rapidly becoming more definite, more exact in all our work at the expense of time.

L. C. Taylor tells us that fifty years ago a dentist who could not put in from six to ten fillings in an hour was too slow. Now some of us will at times spend an hour in the mere preparation of one cavity.

The many uses to which porcelain can be adapted, and the preparation of the tooth to receive and retain it, the cast gold process of W. H. Taggart, and the great variety of uses to which it can be put, all require time, patience, and practice to attain mastery; and the end is not yet, for have we all become proficient in the humane methods advocated by W. G. Ebersole, and for which our patients will extend the greatest gratitude? Surely, if one man masters all these he has "an infinite capacity for taking pains"—is indeed a genius!

Every dentist who has practiced ten or twenty years or more has his own particular operations, which he performs with more delicacy, more skill, more efficiency than anyone else, but cleverness in a few directions is not enough to render for a patient the best that our profession affords. The well-rounded dentist has striven, and is striving every day, to increase his skill in a multitude of directions, and the burden is becoming so great that he naturally halts at a process which promises to require still greater effort for its attainment. We have tried to load non-graduate assistants with processes which we are loath to give the time to learn ourselves, but he who cannot do everything that his assistant can, and even more, soon finds himself in deep water.

The dental nurse was proposed some years ago, but as yet has no place in the profession, nor is she likely to have. The nurse was to be prepared for a work which takes the surgeon's most exacting skill, if she was to be a clever nurse, or else she was to be a drudge; do we want her—and could we keep her?

The leader of an orchestra does not ask the clarinet-player to take the place of the first violin, or the 'cello player to hand his instrument to the oboe or viola player—and yet they are all musicians, they all understand the notes, time, rhythm, etc., but each has his own peculiar technique, and it is seldom that one man plays equally well on two instruments. The musician's tone, time, rhythm, and phrasing fall continually upon critical ears during his public performance; but the skill and art of the dentist in its minutiæ has no critic except time and his own conscience.

My aim in this paper has been to stimulate an interest in oral prophylaxis. I have tried to show that it is important, that it is needed, that the technique is exacting, that it is interesting, that the field for the work is vast, and that it is not to be adopted except as a most serious and important undertaking.

We are members of a busy and exacting profession, and the time is at hand when there must be division of labor. I am certain that oral prophylaxis offers inducements to more dentists to specialize in than does orthodontia, and the gratitude of patients for this work is very great. Someone has said that it takes a peculiar conscience to practice prophylaxis, but in my opinion it is not necessarily a peculiar one, but it does take a conscience, and when we see the great need for prophylaxis and do not practice it, our consciences must be calloused indeed.

Discussion.

Dr. A. L. Swift. I have been greatly interested and benefited by hearing this paper. I have spent a good part of my time for a number of years in the practice of oral prophylaxis, and I feel that the subject has been so thoroughly brought before you that there are only a few points which I can discuss, for I agree entirely with the essayist in almost all of his deductions, although I take exception to one suggestion in his paper. He believes that it is necessary for a man to specialize in oral prophylaxis to become proficient. I have often felt that

if I could have in my practice a thorough specialist in prophylaxis as an assistant it would relieve me of a great deal of laborious work, but I have been unable as yet to find any such assistant, and I have not had the time to devote to the education of one. I have spent at least half of my time for a great many years in the practice of oral prophylaxis. Some of my friends have been fortunate enough to secure assistants who, they feel, are perfectly competent to do this work for them. I wish I had been so fortunate. I find that I learn something in the direct practice of prophylaxis every day of my life. I grow more and more interested in it, and I stated many years ago in bringing up just such a plea as Dr. Spalding made tonight, at a meeting of the New York State Society in Albany, that I knew of no work that I had been called upon to perform which was so exacting, or so tiresome and tedious, work which, after a number of years of daily practice, required all the technique I was able to give to it; yet that I had never done any work which had yielded the same satisfaction to me as oral prophylaxis.

Comparing any of the other work which I have been able to do with the work of systematic oral prophylaxis, I feel that the best work I have ever done has been along this line. The necessity for careful, conscientious work—work of the highest type of technique, as referred to by the essayist—is most insistent.

One of the principles of my practice which I have always followed, is to point out to the patients the necessity for oral prophylaxis—to give them a hand mirror, and, with the mouth mirror and a probe, point out the pathological conditions present and show the necessity for oral prophylaxis. Then, as the treatments progress, the improvement in the mouth should be shown to them. After having given proper instruction as to the use of the brush, and how to cleanse their teeth, if on their return I find signs that my directions have not been carried out, I take the mirror again and show them that they are not doing what I expected them to do. I have never had any difficulty in educating patients to the necessity for oral prophylaxis, when it is done in this way. The results have been so satisfactory to the patients that I find it easy to secure their subsequent return for treatment. The more convincing I make the argument, the more ready they are to return for a continuation of the treatment.

If a patient presents a mouth such as the essayist mentioned, one which is in a sad state of uncleanliness and decidedly unhealthy, in which caries is rampant, the conditions together with the susceptibility to caries are pointed out to him, and by painstaking work carrying the case along, I finally get that mouth in as nearly a healthy condition as possible—showing the patient that the arrest of caries as well as the improved hygienic condition can be achieved. This plan has for many years yielded the most gratifying and satisfactory results.

I have no idea of specializing as an oral prophylactist. I limit my practice to the number of patients I can take care of—both as to prophylaxis and other operative work. As I said before, if I were so fortunate as to have an assistant who had had as much experience as I have had, or who was equally successful in prophylactic work, I would be glad to get rid of this tiresome and tedious labor—for it *is* tiresome and tedious if you spend about half of each day at it. Yet the results obtained in the years I have been practicing oral prophylaxis as a distinct part of my daily practice have entirely compensated me for such labor.

If you have been practicing dentistry for over twenty years, and have practiced oral prophylaxis conscientiously for all that period, it is a great satisfaction to see what it has accomplished.

I need not emphasize the necessity for oral prophylaxis, as I have so many times expressed my opinion as to the great necessity for this work, and I have been called upon to discuss this subject so many times that I feel it is wasting your time to call upon me, because my feelings and utterances have never changed

in regard to this subject. I feel the importance of it more and more, and if the paper of this evening, and the essayist's plea for the adoption of oral prophylactic measures of a thoroughly conscientious type, stimulate us all to do our duty in this most important field of work, our brother from Detroit has not come to us in vain.

I take exception to the reference which has been made that prophylaxis is a fad of the West. I took exception to this when our late good brother Dr. Wassall of Chicago came here and read a paper on this subject. He also had an idea that prophylaxis was a fad of the West; but I convinced him that the East had written on that subject, and had preached it for a great many years before we had ever heard anything of it as being a western fad.

If all will take this paper and its precepts to heart—especially those of us who have not been doing our full duty to patients in regard to oral prophylaxis —as the essayist has said, the benefits which will accrue in our practice cannot really be measured. Thorough prophylactic treatment is truly preventive treatment. I can vouch for that from my own personal experience; and the satisfaction to the patient and to the dentist, I assure you, will repay each one of us for the necessary expenditure of time and nervous energy. What can be accomplished by beginning and continuing oral prophylaxis at an early age can hardly be measured. It is not easy to teach an old dog new tricks; but if you take young patients, and teach them thoroughly the proper care of the teeth, and if you take pains to show them with a hand and a mouth mirror in how far they are not accomplishing what they should, impressing upon them the necessity for co-operation in supplementing the dentist's work, as well as educating them to the necessity for frequent prophylactic treatment, I know you will all feel amply repaid for your trouble.

Dr. R. G. Hutchinson. It would not be possible for me to add to the paper read by Dr. Spalding tonight. It embodies perfectly my views in every detail most concisely and fully. I merely want to indorse without qualification everything Dr. Spalding has said.

The treatment that Dr. Spalding has described is more therapeutic than prophylactic, and can be accomplished only by those who have devoted a great deal of time to its consideration. True prophylactic or preventive treatment, either before disease has occurred or after it has been cured, should be the work of every general practitioner; but unfortunately it is not so as yet. Where such conditions as have been described by the essayist have been cured, we find that, if subsequent treatment is left to the general practitioner, the disease will often recur, because very few know what to do in order to prevent recurrence. No man who is practicing dentistry should be incapable of doing this work; but I believe, with Dr. Spalding, that specialization is necessary. It may not be an exclusive specialization. Dr. Swift is a specialist. He has given more attention to this subject than to anything else. There are many who are achieving success, but the proportionate number is small. I believe the time will come when a large part of every reputable practice will consist of prevention, not only of pyorrhea, but of all diseases of the mouth and teeth.

Dr. H. W. Gillett. I can say little other than to voice my general approval of the ideas Dr. Spalding has presented. The subject is one to which I have given some attention, but in which I have not attempted to specialize. I have patients to whom I attempt to give the same frequent treatment that the specialists do, and I obtain results which are satisfactory to me and to them. The subject is one which ought to receive more attention from the general practitioner than it does at present, and it must have more attention in the future if we are to come anywhere near meeting the requirements that are to be put before us in the next decade. The awakening of the medical profession to conditions in the mouth, and to what they lead to, is well under way; it has not nearly reached its full development, in

my estimation, and the medical profession is going to demand a great deal more of the dental profession as a whole than they have in the past. Hand-in-hand with the realization on the part of the general practitioner of the need for this constant care must come a realization of the disastrous effects of some of the dental sins of omission as well as of commission along other lines. The unspeakably careless plastic fillings, the ill-fitting bands, and the projecting inlays that are found only too commonly, are provocative of nearly as much trouble as are neglect and general uncleanliness. There is very little use in preaching prophylaxis to the practitioner who does that class of work, or to the patient for whom he works, because neither is capable of realizing the results.

Dr. Rhein. I am much more in accord with the discussion of Dr. Swift than with a great deal of what Dr. Spalding had to say on this subject. This is not, as many of you know, a new topic to me. It has engaged my earnest and serious attention for thirty years. The very first week I started in practice I began the practice of prophylactic treatment of the mouth. In fact, in the third year of my practice, in this very building I read a paper on oral hygiene, when I introduced to the profession the prophylactic tooth-brush. I simply state this in order to make clear that it is not my desire to offer any captious criticism on the very able paper we have listened to. I question whether there is anything in all our profession that is dearer to my heart than this subject of the preventive care of the mouth.

I agree in the main with the conclusions of the essayist, but serious errors have been made, to say the least, in a great many of the statements and doctrines on this subject that have been presented to the profession and to the public in the last few years. The profession at large is to a certain extent misled by many of these statements, and if I am to discuss the paper of the evening rationally, it becomes my duty to make these points clear—remembering that I realize from the very able character of the work of Dr. Rogers, that the intrinsic value of the work done in this field in the practice of Dr. Spalding is of the highest. This criticism has no bearing whatever on the technique or detail of her work.

Dr. Swift has wisely said that this technique becomes more highly developed the longer it is continued. There is no question about that, and the differences in the character of the technique all denote the differences of the individual who does the work. The question at issue is, however, How shall the people receive the benefits of oral prophylaxis, or prophylactic treatment?—call it as you will. I might say in regard to the name, that as I introduced this name into the profession, I ought in a sense to have something to say in regard to its character—whether to use it as an adjective, or as a noun. Personally, I prefer the term "prophylactic treatment," because it conveys a much greater significance to me than if the noun "prophylaxis" is utilized for this purpose.

I agree with the essayist in the necessity for careful examinations of the mouth of the patient after treatment. It is only after such treatments that the real condition of every portion of the tooth is discernible by the dentist. If a practitioner makes a specialty of this work, it becomes a question whether he is capable of making as careful an examination of the exact conditions of a mouth as the general practitioner; in this regard Dr. Spalding very likely uses the same methods as I do. It is customary in my office, after a prophylactic treatment, to carefully inspect the mouths of my patients for this purpose. It is astonishing to me how easily some practitioners pass by and overlook, not deposits, but plaques, in such conditions. Often patients have told me, after having been away on a journey and having been referred by me to some *confrère* for prophylactic treatment, that they had been told their mouths required no treatment of this kind. It is true there were no hard deposits of any kind, but there were plaques upon the enamel of the teeth, and these plaques are only discernible

under certain conditions, when the teeth are thoroughly dry.

Before proceeding farther, I want to add a point which Dr. Spalding very likely overlooked. There is nothing more important, in my opinion, in the prophylactic care of the mouth during these treatments, than to determine whether too much strain or stress is being exerted in mastication on any individual tooth. This is a very important factor, because at these frequent treatments such conditions are readily perceived, especially if, as is usually the case, some filling is involved. The teeth do not wear down in a regular line, thus leaving the fillings to stand the brunt of mastication. It is one of the important points of prophylactic treatment that this stress on any particular filling should be reduced at the time of these treatments. I have no doubt that the omission of this point was simply an oversight on the part of the essayist.

The real point of the problem is this: Owing to the stress of a general practice, very few men are willing to limit their practice in the way described by Dr. Swift. I consider his description of his practice an ideal one, and one that cannot be too highly commended; but next to that, the only efficient method is the one described by the essayist, in which the two systems are combined. This is what I believe, if I am correctly informed, the essayist practices; yet he comes here tonight and portrays a picture to us that is entirely different, in which he recommends that this should be made a specialty—that a man should practice this separate from the general practitioner; and this is the fatuous part of the proceeding. In the first place, it is impossible for one man to practice oral prophylaxis properly unless he does it in the manner described by Dr. Swift. Anything short of this is a myth and a delusion, and is an outrage on the patient, because prophylactic treatment does not begin and end with keeping the mouth absolutely clean, its environment free from foreign matter and pollution, and everything else that the technique of the subject involves—that is only an important accompaniment; neither is it right or proper that a man should practice as a general practitioner and engage a specialist to do this work, he himself paying no attention to it. This is just as faulty, if not worse—it is an imposition, to my mind, upon the patients who come to the general practitioner and intrust their mouths to his care. It becomes his duty to know whether that work is done in accordance with his ideas, and to know what is left over for himself to do.

It is on this point that the essayist has seen fit to place himself in opposition to my well-known views on this subject. The technique, as Dr. Hutchinson has so well said, of the prophylactic treatment, should not be confounded with the therapeutic treatment—the surgical or therapeutic treatment—put it as you choose. The technique of the prophylactic treatment, when you come to analyze it, is really a very simple matter; when to this you add therapeutic treatment it assumes a more complex form, but it does not require a great amount of ability to master the technique of prophylactic work, and to master it thoroughly—neither is it necessary for a dentist to do the prophylactic work.

Dr. Spalding has decried the idea of the dental nurse, and yet I know of an office outside the state of New York, and within two hours of this city—and it is one of a hundred offices that I know—where that work is done by a dental nurse, and there is none better done in the world. It has been done for some years by a dental nurse, who is not a graduate in dentistry. If we desire the benefits of oral prophylaxis to reach our patients—all patients—there is no other rational method of doing the work.

I am willing to admit, for the sake of argument, that it is better to have a dentist trained for this purpose; but is it feasible to do the work demanded in this way? A careful consideration of the subject will demonstrate that the difficulty in this respect is great, inasmuch as it is hard to find a man or woman willing to go through a thorough dental education and then limit himself or her-

self entirely to the work under consideration. They may do so for a short time, but they will not long limit themselves to it. On the other hand, it is an easy matter, were an institution for the purpose properly inaugurated, to train men or women in knowledge of the anatomy and physiology and pathology of the parts—give them a thorough didactic training as to the value of that work, and to teach them as to its technique by means of the poorer classes of the population, perfecting them in simple prophylactic work; and with normal skill they can rival anyone. This I have seen demonstrated over and over again.

Now I come to a very important point, viz, the unfortunate exaggeration of what prophylaxis will do for the human being. There is a limitation to the benefits of prophylaxis, as any observing practitioner has observed in his cases. To make myself clear, and to show what prophylactic treatment will not do, I will recite briefly two practical cases. I have in mind a woman now at the age of twenty-five, whose teeth have been under my care since she had her first tooth. I certainly ought to know what the conditions of that mouth are, because up to the time she married and went to Europe to live—about two years ago—no one outside of my office ever had anything to do with her mouth. I never had a more faithful patient than that child. The principles of prophylaxis were instilled into her from her very first tooth, and as showing the relations between the patient and myself I may say that I have not a more devoted friend today than this young woman. The first few years of her life, up to about the thirteenth or fourteenth year, the benefits of prophylactic treatment were beautiful; and then she became ambitious. She commenced to study harder than her physical powers justified. She was an ardent musician; she went to Barnard College here, and at the end of her freshman year what was the result? Notwithstanding the most careful prophylactic treatment, erosion started around almost every surface in the upper jaw, labial and buccal. A gingivitis started there, notwithstanding care that I have never seen excelled. The cause? —malnutrition. I am not giving you a fancy picture; this patient is in the city of New York at present, on a visit. The result is due to the fact that there was not nutrition enough to supply all the body, and all the prophylactic treatment in the world could not help her. Last summer I visited this patient abroad. I found her then the mother of a child of fourteen months. I remained as her guest in Switzerland about six days, and found out that the principles instilled in her had been so strong that every month since she had been abroad she had gone on a half-day's railroad journey to reach a dentist competent to do prophylactic work. Her education in that respect had been sufficient to make her realize that dentists nearer by, whom she had tried, were not capable of giving her the proper treatment.

Here is the sequel of this story: When I examined her mouth I was a very astonished man. I saw the most beautiful and the healthiest mouth possible. The porcelain inlays I had put on those buccal surfaces were almost half covered over with the new gum tissue that had come down—there was not a sign of gingivitis or deposit or plaque. From the ambitious, overworked girl, she had developed into the Swiss hausfrau, leading a quiet, secluded life, and not suffering from lack of nutrition.

I am showing you where prophylaxis had accomplished its purpose, and where under certain conditions it was incapable of doing it.

Another case presented only today—a lady of fifty-three or fifty-four years. She had been a patient of mine about fifteen years. She is one of those patients whom her family complain of, because of the time and care she takes in carrying out my directions in regard to her mouth. She has had monthly treatments at my office, with the exception of those times when she was absent from the city. The woman has a slight tendency to diabetes, and every once in a while, notwithstanding this care, a condition of gingivitis will start in this mouth, and

during this last week it has started in a most alarming manner. The mucous follicles have started throwing out or eliminating an abnormal amount of fluid. The result was that she came to me today and said, "Dr. Rhein, I have come direct from my physician. He has asked me to stop brushing my teeth, because he claims that my gums and my mouth are sore from that. I know this cannot be so, and I told him I would not do so until I saw you." I telephoned to her physician. He insisted the trouble was local, and I insisted that he had not gone over his patient as carefully as he ought to—and that is the status tonight. Personally, I am positive this woman's general condition has taken a turn for the worse, only he as a busy medical man has not examined her with sufficient care.

These are two pictures that I have taken from my office, and I simply show them to you in order that you may understand the real value of prophylaxis.

Just one word in conclusion: If prophylaxis is to be thus carried out—whether under the method of Dr. Swift, or of the essayist and mine (for I believe mine is identical with the essayist's)—it is essential that such an office should take no patients unless they submit to proper regulations. It is essential that patients should come when they are sent for, not waiting until they get ready to come, in order to get the full merits of the treatment. I do not wait for my patients to ask for prophylactic treatment; they are sent for. We have special appointment cards which state distinctly "This appointment is for prophylactic treatment," and the patient knows what it means. It is my invariable rule not to accept any permanent patients unless they are willing to abide by that rule, because otherwise I would not be treating my patients honestly.

There is nothing that I have said that in any way detracts from the great value of the essayist's paper, and as far as the principles that are carried out in his practice are concerned I know that I am in perfect accord with him; I cannot but believe, however, that in his paper he materially contradicts his own method of practice.

Dr. S. G. C. Watkins, Montclair, N. J. I think that none of the gentlemen who have spoken have gone back far enough. They are on the right road, no doubt, so far as they have gone, but I believe the real first step of prophylaxis is to get back to nature. If dentists would spend as much time in teaching their patients to go back to nature as in teaching them to adopt the prophylactic measures they are trying to instil into them, I believe they would do more good.

In the first place, I do not think it possible to have a good set of teeth without using them thoroughly in mastication, and I do not mean exactly Fletcherizing—"chewing" soup and oatmeal, and all those things—but I mean chewing things that should be and can be chewed; going back to nature and chewing the proper kind of food, which is not cooked to that soft pulpy condition which does not require chewing. In doing that the teeth will be cleaned, and in the gymnastic exercises and massage produced in chewing, the gums will be strengthened, and the teeth will be fed with good, healthy blood, and then there will be little use for our prophylactic preaching. Of course I admit the value of and I practice the teaching of prophylaxis when the conditions are there which require it; but I do not believe there is enough emphasis placed upon the idea of prevention through use. I believe that not any half-dozen things which you can do will go as far toward preserving the teeth from pyorrhea and decay as thorough mastication of the proper foods. If that is done, there will not be a great deal of difficulty in using the proper prophylactic methods in the mouth to keep it in a healthy condition.

Dr. M. I. Schamberg. This subject brings forcibly to my mind that this is a day of specialization, and when I speak of this work as handled by the specialists, I am not conflicting either with Dr. Rhein's views, or Dr. Swift's views, or the essayist's. I mean the person must be especially prepared to do this

work, and have a well-trained eye and hand to do the work properly. When I was doing general work in dentistry I sent a patient to Dr. Rhein. When he saw the patient and I told him I had scaled the teeth, I recall very well how severely he criticized me and told me that I had only begun to scale that patient's teeth; and I was convinced later that he was right. So it becomes almost impossible for anyone, unless he practices that work almost exclusively, to do the work thoroughly.

Dr. Watkins says we must go back to nature, and he struck the keynote of all prophylactic work, now as fifty years ago. They recognized the need then, and it was noted in the text-books; but there was not the need for it then that there is now. With the advance of civilization we encounter highly specialized foods for highly specialized workers.

Dr. Watkins says we should go back to nature. It would be the means of overcoming the difficulty, but we cannot stop the progress of time. We cannot check the advance being made in mental condition, with the retrograde condition physically, and find elements that were present years ago. How much pyorrhea do you think was detected in the negro, or in the lower forms of animals, before they were brought into captivity? And so with the advance of civilization, we find the need for highly specialized training, and it is evident by the remarks of every speaker this evening, that that training can be acquired only by the constant handling of these cases. No general practitioner of dentistry today is able to do that work himself and keep up with the progress in other directions in dentistry. For that reason certain problems confront us, and those problems are affected by several conditions. One man takes on fewer cases and does a good bit of that work, and does as much filling as he finds consistent with his time. Another man uses an assistant and guides that assistant in his or her work. A third man is an absolute specialist in the work; he naturally gets the graver cases, and is unquestionably better able to handle those cases—cases which have gone beyond the range of the average practitioner.

It is very much the same in medicine. The general surgeon today is complaining because every now and then there is a new specialty. Some years ago the general surgeon did all the eye work; the general surgeon of the hospital very reluctantly gives way to the oculist, or say the rhinologist, or the aurist; for that same reason it is difficult to get most institutions interested in having an oral surgeon, because they know it trespasses on the general surgeon's work.

I believe Dr. Rhein is right, that if the dental profession want to have due control over their patients' mouths, the proper solution of the problem would be to have dental nurses qualified to practice only under the supervision of a licensed practitioner. That, however, does not take the place of the pyorrheal specialist, who is supposed to handle graver cases, in which the treatment implies more than the scaling of the teeth; and that further emphasizes the fact that I am a believer in other causes than deposits upon teeth as the cause of pyorrhea. I operated last evening on a little girl, before my class in oral surgery, and they had the opportunity of seeing a pronounced case of tubercular pyorrhea, in the mouth of a young girl about twelve years of age, in which every bit of the alveolus was lost from every tooth of the lower jaw, so that there was no supporting bone at all; it was merely a question of removing them. All the teeth had to be removed, and there was no bony structure supporting them whatever. There were no deposits in this case, but the child showed every evidence of tuberculosis, having a pronounced hip disease. This child unquestionably suffered from a tubercular pyorrhea with the absolute loss of all supporting structure to those teeth, and if that could exist in a case of tuberculosis it can exist in a milder form in cases of malnutrition, in cases of excessive uric acid, in syphilis, in Bright's disease and diabetes.

The great trouble about the dental profession, and the only criticism we hear made of dentists is that they are so

closely confined to the work in the mouth, and there is so much to be done and so much that is technical, that they often see no farther than the mouth. If you would go into the office of a dermatologist in any large city, and see some of the skin affections, some of which are local and some of which are from systemic diseases and can only be controlled by a combination of systemic and local treatment, and realize that those things which happen to the skin can likewise happen in the mouth, you will be forced to the conclusion that we are overlooking something when we believe that all troubles in the mouth in connection with the teeth and mucous membrane, or the socket of the tooth, are due to oral uncleanliness and can be eradicated by cleanliness. So I am in accord with Dr. Rhein in his belief that there is a tremendous oversight in dealing with this subject, and that too much importance may be placed upon oral hygiene and oral prophylaxis; and for that reason a well-directed paper such as we have heard tonight is bound to do an immense amount of good. It is a great mistake to think for one moment that oral cleanliness is a panacea for all ailments.

I might say in this respect that the name of the man who has been responsible for the claims that have been made for oral prophylaxis has been subject to censure by the medical profession because he claims that it will eradicate many of the diseases of the body—nephritis and most of the intestinal disturbances. We know there is a reciprocal influence between the system and any of its component parts, but to say that work within the mouth is going to eradicate these troubles is on the face of it unworthy our attention.

Dr. B. C. Nash. I would like to continue this discussion for one reason: All who have spoken seem to have assumed a cat-and-the-canary attitude, they are so self-satisfied. I am unwilling that this discussion should have only one side to it. It would seem as if every man who had recognized the need for cleaning teeth had assumed that his observations in that direction were original, his operations unique, and that the dental profession in general were either neglectful or incapable.

If we could see some of the results that had been obtained and honestly weigh them in the balance, and feel that their accomplishment was much greater than ours, it might be convincing; but dental prophylaxis—even the name itself according to Dr. Rhein's statement, is at least thirty years old—has been practiced for many years by men who were capable of perceiving and projecting themselves honestly into the work and the duty that they had in hand. I was brought up in a school as high-class as any of the gentlemen present. I have had opportunities of seeing, of listening, and of knowing that the need for cleanly mouths was fully appreciated. My own realization of it has been expressed in my individual practice to my full capacity, limited only by the control that one can have of his patients—and that limitation applies to every man who has spoken here tonight, whether he claims to be exclusive in his selection of patients or not. The question of prophylaxis as opposed to the mere cleaning of teeth is simply one of repetition. It may be necessary, in order to obtain ideal results, that these processes be repeated at stated intervals, and that would apply to simple conditions rather than to the more complex, because all who have specialized in this direction have said, Eliminate incurable cases; and I believe the general practitioner should be capable of efficiently treating the simple cases that present to him every day in the week.

Dr. Charles F. Ash. The subject as given in the program is "Prophylaxis as a Special Field in Dentistry." The subject of the paper, as it appealed to me after hearing it, might have been an appeal to the profession to recognize the importance of this branch of our work.

A remark made by Dr. Gillett brought to my mind a particular phase of this subject about which I want to say a word. Dr. Gillett said it was necessary for dental practitioners to impress upon

the medical fraternity the importance of this work to the patient. Endeavoring always to be conscientious toward my patients in this part of my work, I have had a great many results that were very pleasing to me. It has been a part of my office work that I have been particularly interested in and have been glad to do, both for the sake of giving the patient comfort and for the satisfaction obtained from seeing the results. In spite of the fact, however, that I have been doing that work for quite a few years, it is nevertheless true that it is only within the past few years, and more especially within the past few months, that I have recognized conditions in the mouth which I never recognized before; and I think that what we need in our profession more than anything else in this connection is the showing to the average man conditions in the mouth which, I believe, he does not recognize.

I do not take exception to what Dr. Nash has said because I know that a great deal of very effective work is being done by the man who is doing just his ordinary conscientious duty by his patients. That was what I believed I was doing, but I did not see it all. Within the past few months I have seen mouths that have been examined by very capable men—I have in mind two cases coming from the jurisdiction of a very capable man, a man whom you all know, and a man who has had double the experience that I have had; yet in spite of that fact there were conditions in those mouths which he had not recognized, and which I should not have recognized a few months ago. The mouth looked clean, and the gums were pink, but there were places in that mouth where a smooth broach could pass down between the teeth and the gum, from an eighth to a half inch; and you could not recognize the diseased condition unless you went around each tooth and examined it in that way. That is where the average man should be educated.

I was just wondering, as I sat here, how much more of this teaching students in college get today than when I was in college; and I thought, if they did not get any more, God help them!—because they will have to learn it when they get out. After a few moments, when I recalled that Dr. Swift is a teacher in one of our colleges in this city, and an enthusiastic worker in this direction, I thought it was impossible for a student to go out of that college without having this work taught him; but I am not so sure that it is done by every man who teaches in the dental schools.

The necessity is not so much for specializing in this field as for getting the dentist who has been in practice for years, as well as the young men, to recognize conditions in the mouth which are every day being overlooked.

Dr. J. Lowe Young. I have known Dr. Spalding for a number of years, and know how earnest he is in his work. There were a number of facts brought out tonight, but some have not, however, been touched upon.

Dr. Swift said it was hard to teach an old dog new tricks, and I agree with that thoroughly. Dr. Ash spoke of how little of prophylactic work he was taught in college. That is one of the greatest difficulties; our young men are graduated, as a rule—I except some of them—with practically no training along this line. They are started wrong, and it takes a long time before they learn these things. Without being personal, I believe that the man who is confining himself to any one branch of the profession, if possessed of an equal amount of ability, can and will do better work along that line than the man who attends to a number of branches. The man who is practicing orthodontia exclusively, and is having patients referred to him by general practitioners, is in a good position to judge of how much attention is being paid to prophylaxis. I have had numbers of patients come to my office for orthodontic work, when it was absolutely essential that their teeth should be cleaned before it was possible to take an impression. If such conditions are general, it stands to reason that a large percentage of the dental profession are

not paying proper attention to this work. We all agree that a great deal can be done by proper prophylactic measures, and the earlier that is instilled into the dental student, I believe, the better.

Dr. Ash. I left out a very important point that I wished to make. I think one of the reasons why the average practitioner does not recognize these conditions is because they are so difficult to discern without the use of the probe; the time when they discover them is when they have gone so far that the tooth is lost. A case we had under discussion a few nights ago was typical of this condition. A man who was in my office, a man with a very high physical resistance to disease and a most perfect type of development, had several teeth in very bad condition on account of pyorrhea. It was only because that man had been resisting the disease for so long and it had progressed so far that it became so difficult to cure. In the mouth of a patient less highly resistant those teeth would have been lost long ago. The cases, as a rule, are not recognized by the average practitioner until they have gone so far that it is difficult to cure them, and that is why the profession should be educated to recognize the conditions in their incipiency.

Dr. Spalding (closing the discussion). Dr. Swift takes the stand that the general practitioner is able to do the work in oral prophylaxis as well as the specialist. I think Dr. Swift is an exception, for I believe that he does exceptional work in all branches of dentistry, including prophylaxis, but I do not think I am able to do so, nor do I believe that there are many men who can be proficient in the technique of all the varied and complicated processes expected of us today. Dr. Swift says the work is burdensome and irksome to him, and yet he enjoys the results. I believe if he were specializing in oral prophylaxis he would not find it burdensome.

Dr. Swift. I think I would find it more so.

Dr. Rhein. Tell us why you do not do it.

Dr. Spalding. If it were possible for me to do so I should enjoy it. Fortunately I am associated with a specialist and my patients are well cared for. Should I move to another city and begin a new practice I would specialize in prophylaxis. I have spent several years in endeavoring to become proficient in one or two other branches of operating and have a full practice in those branches, and as my patients are receiving excellent care in prophylaxis I do not think it wise to change my work; but my patients are educated in prophylaxis, and if I did not provide for their receiving regular treatment they would soon seek it elsewhere.

A dentist whom you all know, who is at the head of one of our best dental colleges, told me that should he leave the college he would devote his time exclusively to oral prophylaxis. Another dentist, of Binghamton, N. Y., told me three days ago that he expects to specialize in oral prophylaxis in Buffalo. This man is exceptionally fitted to practice dentistry, being a graduate of Yale College and of the Buffalo Dental College, and a man of very high ideals. Now, if this work is so irksome and tedious as a specialty, would men like these be willing to devote their entire time to it? Of course every dentist cannot specialize in it, but every dentist should work at it until he can see the great benefits to be derived, and then if he wishes to confine himself to some other branch he will insist on his patients having treatment by a specialist. It is true that a dentist who has not for some time worked at oral prophylaxis cannot see and appreciate its full benefits. Dr. Nash said that the ordinary practitioner of dentistry, unless he does the work, cannot see it clearly—and the more he works the more he sees.

Dr. Swift. If you did not have an associate doing this work, would you send patients to a specialist for it and have them go back and forth for other work?

Dr. Spalding. I think I would. Anyway, one thing is certain, if I had not an associate, and could not do the

work for my patients myself, they would now go of their own accord to someone who could give them proper treatment, for they have learned its benefits.

Dr. Swift. If you had a few patients and gave them your whole care, do you not think you would be able to take better care of them, if you were a competent prophylactic operator?

Dr. Spalding. Yes, if I were a competent operator not only in prophylaxis but in all other branches of our complex and exacting profession—but I am not. Finer and better work is being required of us every year in dentistry, and I maintain that as better methods and processes are developed, it is not possible for one man to even approach his ideal if he tries to master the technique of all branches. I believe that few men not practicing it have any conception of the exacting technique of prophylaxis and the treatment of pyorrhea, and that for the operator to be able to arrive at the thoroughness necessary to success, constant application to this work alone is required.

Dr. Swift. You still rather advocate that every man ought to be a sort of specialist?

Dr. Spalding. Every man ought to work at prophylaxis until he sees at least a portion of its benefits, and that it requires something more than a little of his spare time to put it into practice as it should be done. Then he will endeavor to solve the problem of how it should be secured in his own practice. As his patients become educated they will make a demand for treatment.

Dr. Gillett remarked that work in oral prophylaxis improves a dentist's other lines of work, for it raises his ideals. Yes; he sees that he has not been careful enough in his restoration of the interdental space, his contour work, his care of the gingivæ, the finish of his fillings, etc. He finds that amalgam, cement, etc., do not satisfy him, that he has not done his best for his patient when he has used these materials, and he is constantly substituting better materials.

One reason why I am opposed to the dental nurse is that she does not know about different operative work, its possibilities, the restoration of occlusion and many other factors in prophylaxis which it is hardly possible to be acquainted with unless one has had a thorough course in a dental college and experience in practice. A dental nurse does not have sufficient grasp of the subject to direct the correction or performing of such operative and mechanical work as is often necessary, and the need for which can only be determined by the close study of the case with reference to prophylaxis. If polishing teeth is all there is to prophylaxis, then the dental nurse will do, but oral prophylaxis is much more than that.

I do not believe as Dr. Rhein does that if a dentist has a dental nurse in his practice he can make a brief examination of a patient just finished by the nurse and grasp all the conditions of the case and direct minutely further treatment. I believe that it takes the careful study of each case made possible only by personal treatment to really know the conditions.

I do not dictate in any way to my associate how she shall conduct her practice in her special work of prophylaxis. Dr. Rogers frequently suggests to me how she wishes certain restorations to be made for her patients to better further her work.

Dr. Rhein. I might suggest that there are ways *and* ways of doing that. There is a great deal of justice in what you say, but there is a method of overcoming that difficulty. For instance, your assistant—or mine, rather—is instructed to call attention to anything out of the ordinary. My assistants have a little slip of paper on the table, and it calls my attention to these certain points. Nevertheless, it is not an uncommon thing for me to call their attention to plaques that they have overlooked; it is the advantage of two pairs of eyes instead of one pair.

Dr. Spalding. The control of patients of which Dr. Rhein spoke is absolutely necessary to the maintaining of healthy mouths for them. There will be

no regularity of treatment if appointments are left in the hands of the patients themselves. They must be sent for at regular intervals.

The "back to nature" idea of Dr. Watkins is especially good, and I am sure we all agree that proper mastication of food, the rougher the better, is nature's way of stimulating and exercising the teeth and contiguous tissues. A person will not use the teeth, however, if they are not in a healthy and comfortable condition.

There is one plea I wish to make in closing, and that is that we do away with the term "cleaning teeth" in connection with prophylaxis.

Dr. GILLETT. What do you substitute?

Dr. SPALDING. "Treatment." The term "cleaning teeth" has been used in the profession and by the laity a great many years to mean a very disagreeable and aimless operation. Teeth were "cleaned" to please the patient by removing a few visible deposits, but any other object was seldom thought of. "Cleaning teeth" is a work for menials, but treatment in oral prophylaxis is an operation demanding much professional thought and skill.

Dr. KEMPLE moved a very hearty vote of thanks to the essayist for his excellent paper.

The motion was unanimously carried.

Adjournment.

FREDERIC C. KEMPLE, D.D.S.,
Editor N. Y. Odont. Soc.

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PHILADELPHIA, AUGUST 1910.

EDITORIAL DEPARTMENT.

THE STOMATOLOGICAL SYMPOSIUM.

THE Section on Stomatology of the American Medical Association devoted the major portion of its time and attention at the St. Louis meeting to a discussion of the topic "How Shall the Stomatologist be Educated?" and a report of the symposium of views there presented appears in the *Journal of the American Medical Association* for June 25, 1910. The exhibit is interesting and instructive. It is taken for granted that there shall be a stomatologist as a necessary prerequisite, but how he shall thereafter be educated is a conclusion which does not appear to have been reached with any degree of clearness by the deliberations of those who discussed the question and who advertise themselves as practicing that specialty. A more conflicting mass of opinion it would be difficult to find;—yet in closing the discussion the secretary of the section expressed his pleasure and gratification at the unity of opinion which the symposium had brought out!

That there is a broad and most important field of usefulness for the activities of a practitioner specially trained in the study and treatment of pathological lesions of the oral cavity and its contained organs and tissues other than those pertaining to dental caries and its sequelæ we are fully convinced; but that such a type of practitioner can be produced from a graduate of the present medical curriculum with the addition of a smattering of training in dental mechanics we more than doubt. The principal difficulty in the way of reaching anything approaching a conclusion by those who took part in the discussion was their evident lack of knowledge of the actual educational conditions in both medicine and dentistry at the present time. The physicians who were invited to discuss the question, with small exception, contributed little to the elucidation of the problem other than a demonstration of their own lack of knowledge of the subject—which demonstration, by the way, was not without practical value; and the dentists, also with small exception, contributed little if anything more than a demonstration of their lack of knowledge of what is actually being done in the best dental schools for the education of the dentist. This exhibit, also, is not without practical usefulness in determining the real value of the work done by the symposium under consideration.

What did not appear in the discussion at all—and it is, after all, at the root of the whole question—is the fact that the entire system of medical education as represented by the curriculum leading to the M.D. degree in this country is, to put it mildly, wholly inadequate. A student is admitted to a medical school and at the end of a course of four annual sessions issues therefrom, secures his degree, and after obtaining his state license is empowered by law to practice in any or all departments of the science and art of healing—generally excepting dentistry, but in some countries even including dentistry. By virtue of his license he is likewise empowered to execute a death certificate—which, in the light of his limited qualification for an almost unlimited sphere of activity, may be regarded as a wholesome self-protective measure most appropriate and useful under the circumstances.

The progress of medical science and art has been so rapid, the accumulation of data so large, and the new fields opened up in the scientific study of physiology, pathology, therapeutics, and

prophylaxis, and their applications to medical practice, are so vast that long ago it became physically impossible for any single human mind to compass more than a small fraction of this great mass of knowledge. Yet the system of medical education still continues to profess to fit its graduates to intelligently cope with the multitudinous problems involved, by four years of elementary preparation and the acquirement of but a very small fraction of the knowledge essential to successfully confront them. And now it is proposed to create a new specialty of medicine, to be called "stomatology," by adding to the training required by the medical curriculum one or two years of special training in the study of the disease manifestations of the human mouth. This is proposed to be done by preserving the major features of the present dental curriculum and adding them to the previously obtained medical training of the prospective stomatologist, and omitting from the dental curriculum the fundamental medical studies, which it is stated the student will learn better in a medical school.

A careful study of the report of the remarkable symposium under consideration rather strongly suggests that it was pre-arranged so that it could arrive at but one conclusion. The report reeks with the flavor of partisanship in the same manner that a primary political caucus exhales the flavor of the dominating political machine, especially in the feature that, notwithstanding the occasional departures of opinion indulged in by some of the participants, the summing-up of the case by the dominant partisan ignores these lucid lapses and expresses gratification at the unity of opinion which prevailed, when as a matter of fact the unity of opinion is conspicuous only by its absence.

The opinion of this journal is that if the real facts back of the question at issue could be brought out at a symposium not gathered together to enforce the distorted views of its promoter, but one seeking the truth in a fearless and unprejudiced spirit, it would be found that within fairly reasonable limits the thing called stomatology is really the thing now called dentistry by the great majority of those who really know the facts in the case, and that this same stomatology is what is today taught in the curriculum of the best dental schools leading to the D.D.S. degree, a degree that really means what it stands for—a special education fitting the holder to practice intelligently within its prescribed

field—and which does not profess to qualify its holder to do that of which he is palpably ignorant and protect him from the legal consequences of his ignorance by the authority to issue a death certificate.

Dentistry and dental education are unquestionably in need of reform and of further advancement, but no such fundamental reorganization of its educational system is needed as is the case with the curriculum leading to the medical degree. Medicine needs to set its educational house in order and to reconstruct the badge of its training so that it shall truly and fairly represent the knowledge and training behind it. When that shall be honestly done it will not be necessary for the stomatologist of the symposium type to study obstetrics, gynecology, dermatology, ophthalmology, pediatrics, forensic medicine, tropical medicine, and several other interesting and individually important but relatively useless things in order to intelligently treat diseases of the mouth. In the meantime the prospective sincere stomatologist will seek for the major portion of his required special training in a properly and honestly conducted dental school; if he be insincere he will do the same thing, but with the difference that when he has finished his dental curriculum he will spend the remainder of his days in complaining about the defective character of the training he received and preaching the superiority of the medical degree as a means to the attainment of his stomatological ambition.

REVIEW OF CURRENT DENTAL LITERATURE.

[*La Stomatologia*, Milan, January 1910.]

RESEARCHES ON THE DEVELOPMENT OF SECONDARY DENTIN. By Prof. Dr. Gaetano Fasoli.

This series of most interesting experiments has been conducted for two years in the canines and incisors of dogs, the artificial cavities of which were partly left unfilled, partly filled with Harvard cement, silicate cement, or copper amalgam. The results of these experiments, which were presented before the Stomatological section of the Sixteenth International Medical Congress, held at Budapest in 1909, are as follows:

If the fundus of the cavity is too near the pulp, an inflammation of the latter sets in. In the lateral teeth of dogs, which have a very highly developed pulp and long root, the process of repair may be produced by cicatricial connective tissue, under which secondary dentin is formed. If the cavity is filled, the reaction of the pulp is very limited. If the filling material contains no caustic or irritating substances, the pulp reacts exclusively in the circumscribed area correspond-

ing to the dissolution of continuity. A filling material which contains no irritating substance or only a minimum amount of it, such as Fletcher's artificial dentin, produces a minimum of reaction on the tissues. In such a case any modification that may be produced is due exclusively to traumatism. The alterations that occur when the cavity is so deep as to produce an irritation of the odontoblasts are always closely limited to the area corresponding to the cavity. The alterations are observed not only in the layer of odontoblasts directly below the cavity, but also in the layer nearest to the pulp. The rest of the pulp, near or distant from the traumatic area, presents no notable modifications except some slight hyperemia. The odontoblasts in the layer directly below the cavity are somewhat dissociated, and the nuclei are more or less enlarged. The protoplasm loses its granular appearance and does not take the eosin stain. The tissue situated immediately below the odontoblasts sometimes presents hollows and areas of neoformation of capillary vessels, which is shown by a slight circumscribed inflammation. This last phenomenon is especially noticed if Harvard cement is used as a filling material. The dentin forming the fundus of the cavity presents alterations which seem to consist principally in its altered contents in calcium salts. It is observed that the innermost layers become poor in calcium salts, and that this reduction invades the more peripheral layers. In the uppermost layer in the fundus of the cavity a large zone of dentin very rich in calcium salts is noted, which assumes a dark blackish blue shade if treated with Delafield's hematoxylin. This zone represents a protective barrier, as it were, which serves to defend the pulp organ against outside influences. Besides, in the dentin, dark seemingly swollen nuclei are observed, which appear as dense infiltrations in the sheath of Neumann. The secondary dentin at the end of the second month and corresponding to the activity of the odontoblastic layers as well as of the layers nearest to the pulp, showed up very clearly. This process of reaction is always limited to the portion corresponding to the cavity, and forms a protuberance into the pulp-chamber. It is noteworthy that this hard neoformation or compensating dentin is produced preferably at the point farthest away from the cusps of the tooth, while the layers nearer to the cusps present less notable alterations, or sometimes none whatever.

Dr. Fasoli's findings are illustrated by very clear histological slides.

[*Commonwealth Dental Review*, Sydney, February 10, 1910.]

THE TREATMENT OF DISCOLORED TEETH. By Dr. A. E. Gibson.

When undertaking the task of bleaching a tooth, the operator should never make any definite promise of success, for a failure will generally bring about disastrous results, and the loss of a patient. The causes of discoloration may be three: decomposition of the pulp from one of many causes, drugs, or filling materials. For the actual process of bleaching the oxidation method is the one generally employed, the agents in most common use being sodium dioxid, pyrozone 25 per cent. and also the 3 per cent. solution commonly known as hydrogen dioxid, and hypochlorite of lime. The sodium-dioxid method is by most practitioners considered the best, but care must be taken that the drug is pure, otherwise the results will be anything but satisfactory. A good method of ascertaining the purity of the drug is as follows: Place about fifteen grains of the sodium dioxid in a dry test tube, pour in fifteen to twenty drops of water, and the gas evolved will light a smoldering splinter if the drug is good. Having previously disposed of the septic conditions of the canal, isolate the tooth with the rubber dam, and seal the apical foramen with gutta-percha, letting the filling extend up the canal for about one-third to one-half the length of the root. Gutta-percha seems to be the only root-filling that is satisfactory when bleaching is to be done. The tooth is then ready for the bleaching agent, which may be applied in the dry or the moist state. If the moist state is chosen, the best method is to dust the sodium dioxid slowly into a small quantity of ice-water until the liquid is a straw color. The liquid is then placed in the previously dried tooth, allowed to remain a short time, and is then washed out with warm water, this process to be repeated two or three times, which will generally be sufficient. In applying this agent, gold or platinum broaches

must be used, under no conditions iron or steel ones.

The dry method consists in placing a little powder in the cavity, applying a drop of water, washing out in a couple of minutes, and repeating this as often as necessary. If the case is an obstinate one, a two to five per cent. solution of sulfuric acid may be applied, which will convert the oxids into sulfates, which may readily be dissolved. The fact that sodium dioxid is a saponifier aids us greatly, in the following way: Caustic soda being a by-product of the drug, upon coming in contact with the fatty by-products of decomposition in the tubuli forms a soluble soap, that may readily be washed out with warm water applied with force from a syringe—hence the washing-out process is itself an important factor. The sodium-dioxid method removes more completely than any other the contents of the tubuli, and the result is unique, owing to the fact that the tooth is restored not only to normal color but also to normal translucency.

The pyrozone method consists in preparing and isolating the tooth in the same way. The cavity is then dried with the hot-air syringe and a drop of pyrozone is placed in the cavity, and gradually evaporated with warm air, this process to be repeated until the normal color is obtained. In the event of an obstinate case, and if the bleaching is not complete in from twenty to thirty minutes, it is advisable to seal-in a small pledget of cotton dipped in pyrozone, gutta-percha being used as a sealing material. The patient is then dismissed for twenty-four hours, when generally a few minutes will complete the bleaching at the subsequent sitting.

The calcium-hypochlorite method was the first one employed, and was first successfully used by Dr. Truman, whose procedure was as follows: The tooth is prepared as in the previously described methods, with the addition of the removal of any metallic filling present. The powder is then packed in the cavity and a fifty per cent. solution of acetic acid is applied to moisten the powder. The mass is then sealed in with gutta-percha, and the patient is dismissed for twenty-four hours. This application is to be repeated as often as necessary. This method is now seldom used, owing to the difficulty of procuring the drug pure. Bone or vulcanite instruments are to be used, but on no account gold or steel ones. Finally, the cavity must be washed out freely with hot water, dried thoroughly, and sealed after one of the approved methods.

In conclusion, a few stains that often occur will be mentioned, together with the methods best adapted to eliminate them. For a metallic stain, or for a stain brought about by the application of iodin to a tooth containing a metallic filling, the chlorin method is used. For an iron stain, other than that caused by pulp-disintegration, oxalic acid is indicated. This is more effective after the tooth has been treated by the sodium-dioxid method, thus forming an oxid of iron which is soluble in oxalic acid. For silver stains first apply iodin, thus forming an iodid, which may be dissolved by the application of a saturated solution of hypochlorite of soda. Mercury stain calls for the same treatment.

After the successful bleaching of a discolored tooth, the first step, that on which the future success of the work will depend, is thorough sealing, else coagulation of the discolored contents of the tubuli will occur. Sealing is best accomplished by first thoroughly drying the cavity with a hot-air syringe and then painting the walls of the canals and cavity with a thin coat of some varnish, drying this with warm air, and then filling with zinc oxychlorid or some other approved filling. The coagulation method consists in thoroughly drying and filling the canal and cavity with zinc oxychlorid, the zinc having the power during its chemical change to thoroughly coagulate the contents of the tubuli. For sealing canals the method of using zinc oxid combined with oil of cloves or eugenol has very much to commend it, as it is well known that zinc oxid is the best agent available for the prevention of discoloration, owing probably to its hygroscopic properties and its absorption of moisture from the tubuli, little or no discoloration taking place in the absence of moisture.

[*Zahnaerztliche Rundschau*, Berlin, May 8, 1910.]

PIVOT TEETH AFTER DENTAL TRAUMA.

By Professor Brandt, M.D., Berlin.

This author has written repeatedly on the conservative treatment of the teeth, the last time in the *Correspondenzblatt fuer Zahn-*

aerzte, vol. 39, No. 2, pointing out that the dentist need not necessarily strive for the conservative treatment under any and every condition, but that teeth frequently should be removed in order to prevent any untoward conditions arising from tedious and generally useless attempts at preservation detrimental not only to the areas closely approximating the diseased organs, but to the entire organism of the patient. No less is this true of roots which are to serve as abutments in crown and bridge work, or are to be prepared for pivot teeth. In incisors especially which have suffered from trauma, such as a blow or a fall, pivot teeth are contra-indicated. Dental trauma is generally followed by more or less painful periostitis, with putrefaction of the pulp, or some subacute deleterious process. The neighboring bony parts are frequently affected, and a cyst is formed. Even if the pulp has not suffered primarily, it frequently succumbs to circumscribed periostitis secondarily, the central nutrition having been disturbed at first, and then being completely cut off. Discoloration due to the infiltration of red blood corpuscles in the dentinal tubules is the symptom of such processes. Very frequently, however, the crown is decapitated, and a pivot tooth is applied after medicinal treatment of the root, before the process of discoloration has taken place. In such cases acute periostitis frequently occurs, rendering the preservation of the root problematic. After the severe periostitic symptoms have disappeared, the dentist is frequently inclined to make a favorable prognosis, which according to the author's experience is illusory in most cases. If in the course of time a fistula forms in the region of the apex of the root, one is inclined to consider the trouble as entirely harmless. Frequently the injurious effects remain hidden for a long time, the absorption of the surrounding hard tissues progressing very slowly. In other cases, however, very serious consequences arise, especially in patients of dyscrasic tendency. After prolonged mercury treatment therefore, or after a weakening illness, also in cases of tuberculosis of the lungs and in all conditions of debility, the application of pivot teeth after dental trauma is contra-indicated.

The author concludes his report with the clinical history of a case.

[*Journal Odontologique de France*, Paris, April 1910.]

CONTRIBUTION TO THE HOT-AIR THERAPY.

By MM. Ch. Jean and Morineau, Demonstrators at the École Dentaire de Paris.

The merits of hot-air therapy in dentistry, as applied for desiccation, antisepsis, hyperemia, hemostasia, and anesthesia, are reviewed with special reference to the degrees of heat recommended for various purposes by noted recent authors on this subject. The authors discuss the merits of hot-air treatment as applied by themselves in the following four ways:

First: Cauterization at low temperature (50° C.) with slight pressure, for the desiccation of vital teeth.

Second: Cauterization at high temperature (from 110° to 120° C.), applied under high pressure and prolonged insufflation, lasting from seven to ten minutes, in teeth with dead pulps, for sterilization of the dentin and hyperemia of the surrounding tissues.

Third: Cauterization at high temperature (about 120° C.), under high pressure, for the production of hyperemia by insufflation upon the gingivæ in cases of pyorrhea, stomatitis, and fistulas.

Fourth: Cauterization at very high temperature in cases of hemorrhage.

[*Deutsche Zahnaerztliche Wochenschrift*, Berlin, April 16, 1910.]

ON THE APPLICATION OF SULFUROUS ACID (H_2SO_3) IN DENTISTRY.

By J. K. Pedley.

Sulfurous acid, which has been used for various purposes in general medicine, has been tried by the author in the treatment of pyorrhea alveolaris with good results. The mode of application is as follows: After the mechanical removal of the tartar, the patient's teeth are painted with H_2SO_3, and the following mouth-wash is prescribed for daily use: Sulfurous acid, 60 per cent., from 10 to 20 drops to be diluted in a small glass of water. In this dilution the acid seems to have no ill effect upon the structure of the teeth. The author merely wishes to draw the attention of the profession to this remedy, claiming for it special merits in the disinfection of prosthetic pieces. Any thera-

peutic agent applied for this purpose must be such as to exert no deleterious influence on the teeth and the mucosa. Moreover, it should be of reasonable cost in order to lend itself for daily use by all classes of patients.

From twenty to thirty drops of the acid are mixed with water enough to cover the prosthetic piece, which is left in this solution over night and carefully cleaned with water in the morning. If kept in a covered vessel this solution may be used for a week. The effect of H_2SO_3 upon the rubber is most favorable, as it imparts to it a natural-looking, pale tint. Moreover the evil odor of the prosthetic piece is not merely disguised as in the case of mouth-washes, but is really destroyed entirely. No trace of the tartar that is so frequently found on rubber plates is left, and the main objection that many patients have to a prosthetic piece, namely, that of the difficulty of keeping it aseptic, is obviated.

On account of the chemical properties of H_2SO_3 it is advisable to prescribe only very small quantities of it at one time.

[*Revue Trimestrielle Belge de Stomatologie*, Antwerp, March 1910.]

NEW METHOD OF DIAGNOSING DEAD TEETH CAUSING FISTULAS. By Dr. E. Pitot.

In cases of gingival or cutaneous fistulas it is sometimes difficult to determine the culprit tooth. There may be several teeth in the proximity of the fistula affected with chronic arthritis, or one tooth affected by internal infection may be the originator of the trouble. The means of diagnosis are not always sufficiently rapid or reliable. Percussion does not always yield a satisfactory response in necrosis of the pulp of internal origin. The light and heat tests can only reveal a dead tooth, but not the tooth that has caused the fistula, if the roots are the cause. Neither is radiography entirely satisfactory, this process being a long and costly one, subject to error, danger, and insufficiency. The logical means of diagnosis, the injection under pressure into the affected tooth of a liquid which will ooze out at the orifice of the fistula, while it is certain, may at the same time give rise to grave misadventures, especially if applied before the root-canals have been thoroughly cleansed and sterilized, a procedure which requires a great deal of time.

The author claims the credit of originality for the following simple method of diagnosis: The tip of the index finger is placed along the root of the suspected tooth and is made to slide from the neck of the tooth to the apex, while at the same time the tooth is percussed perpendicularly. It goes without saying that a period of the pathological process must be selected when the tooth is not painful. At some point a sort of reflex shock will be felt striking the index finger, comparable to the phenomenon noted upon percussion of an hydropic abdomen. This shock is always observed more or less distinctly, and the variability of its intensity permits even of establishing a prognosis. After a certain period of alveolo-dental arthritis, absorption of the socket of the alveolus takes place. The root, being less firmly inclosed, yields to the percussion, and the yielding makes itself felt in the form of the shock indicated. The farther advanced the absorption, the more clearly perceptible the shock and the less favorable the prognosis will be. In this way the seat and the extension of the lesion may be determined. In the majority of cases the opening will be noticed on the external side of the alveolus, its point of least resistance. The advantages of this method consist in its painlessness, simplicity, certainty, and rapidity. If resection of the apex or curettage of the alveolus is to be applied, as is being advocated for the treatment of chronic alveolo-dental arthritis, the spot most suitable for the incision will be clearly indicated by the phenomenon described above. In concluding, the author invites experiments with this diagnostic method and publication of the results, which in his own experience have never failed to be satisfactory.

[*Deutsche Zahnaerztliche Zeitung*, Berlin, May 8, 1910.]

DENTAL DISEASES IN VARIOUS OCCUPATIONS. By Dr. W. Hanauer, Frankfurt.

The teeth of the working classes—owing to habitual negligence and to weakening constitutional diseases, such as rhachitis and syphilis, which are found very frequently—exhibit, as every practitioner knows, most

appalling conditions, which are aggravated in the followers respectively of various callings by the influences of special deleterious agents that render the destruction of the teeth complete, and produce a series of very grave phenomena of disease of the oral organs. These agents may have the character of dust, or of certain poisons such as lead, phosphorus, mercury, and copper, and also caustic acids. It has been established as a fact that all these agents are far less fatal if the teeth are intact, and that their deleterious influence is the greatest in workmen with carious teeth, such teeth very often being the portal of entrance for these poisons.

The best known and most common of these professional diseases is lead poisoning, which in an acute or chronic form occurs in all workmen who handle lead. The oral cavity is always involved, and the so-called lead-line of the teeth is often a very important diagnostic factor. The poisonous metal being introduced as dust into the oral cavity by the hands, or with the food, or in smoking, the localization of lead poisoning in the mouth is very natural. Lead may, however, also enter the organism in form of vapors. The lead-line in the oral cavity is very persistent, and generally remains even after the other symptoms of lead poisoning have disappeared. It is first of a bluish red, and subsequently assumes a slate-gray shade. The gingivæ appear flabby and swollen, in time the entire mouth becomes inflamed, the teeth become loose, and, if they have been defective previously, painful affections set in, rendering nutrition imperfect. If the teeth are sound, the gingivæ are able to withstand the influence of the lead for years. In unclean mouths, however, with carious teeth the work of destruction goes on at a rapid rate.

A number of personal and public measures have been contrived tending to prevent lead poisoning, the most important of these being the most scrupulous cleanliness. The workmen must be prohibited from eating before having carefully washed their hands. At the closing-hour the hands must again be washed, and the clothes changed, as lead dust has been accumulating in them. Owing to the workmen's negligence and their failure to realize the danger, the law requires employers to rigidly enforce these measures, and also to provide vessels suitable for rinsing the mouth and to see to it that these vessels are really used.

Phosphorus poisoning, owing to the change of technique in the manufacture of matches, and to rigid legislation, is no longer found with the former frequency. Phosphorus enters the organism in the form of vapor—carious teeth again being the portal of entrance for the poison that produces necrosis of the jaws. The danger is especially great since white phosphorus evaporates at room temperature. The symptoms and the pathology of phosphor-necrosis have quite recently been ably described by Dr. Luigi Arnone in the April 1910 issue of Dental Cosmos, page 424. The best way of preventing phosphor-necrosis would be to prohibit the employment of white phosphorus entirely. Only workmen with a perfectly healthy oral cavity must be admitted to this calling, moreover they must practice a most careful oral hygiene, and at the slightest sign of dental disturbance must consult a dentist. For rinsing the mouth, mouth-washes must be at hand. The German law of 1884 imposes upon employers the duty of forcing the workmen to thoroughly clean their hands before leaving the factory, and to rinse the mouth with water.

Mercury evaporates very readily, and produces toxic processes, chief of which is mercurial stomatitis. Here, again, poorly kept teeth form an important predisposing factor. The gingivæ, above all, are attacked; they show slight swelling, bluish discoloration, and bleeding upon slight contact, rendering mastication very painful or impossible. Other symptoms are a repulsive fetor of the breath, excessive salivation, and ulcers in the mouth, which in especially serious cases may lead to gangrene. The teeth themselves are affected by pericementitis or pulpitis. Smokers are more easily affected. Again, frequent rinsing of the mouth is imperative.

Copper poisoning, too, may be localized in the oral cavity. Dr. Ritter in his excellent monograph on "Diseases of the Oral Cavity in Various Callings" (published in Weyl's "Text-book of Workmen's Diseases," Jena, Gustav Fischer, 1908), has repeatedly noted as the first symptom of general disease in copper workers a swelling of the gingivæ, together with a stain on the teeth, which is generally of green color.

Of the acids hydrochloric acid especially attacks the teeth. This acid is formed in workmen who handle chlorin in bleaching establishments, soda factories, and similar plants. The chlorin vapors combine with the saliva of the mouth, generating hydrochloric acid, which in time dissolves the tooth substance. The teeth suffer also in shops where the vapors of nitric or sulfuric acid are developed—the teeth, especially the incisors, breaking off in small pieces.

Disturbances produced by various dusts are noted in bakers and turners. The dust of flour is deposited in the interstitial spaces and cavities, and forms a good culture medium for bacteria, developing acids and destroying the teeth. The same has been noted in confectioners who breathe sugar dust, the incisors being the first to succumb to caries, which gradually affects all the teeth. As a preventive, careful toilet of the mouth is important. Turners often suffer from the dust of mother-of-pearl, which affects the bony tissues of the jaws. Inflammation sets in, the teeth become loose, and pains are noted simulating neuralgia. The face is swollen. After some time the affection gradually subsides, and the jaws reassume their former size.

Poisonous dyes can become dangerous if the clothes impregnated therewith come in contact with the mouth and the teeth, and may produce morbid phenomena. In tailors gingival inflammations have been noted, caused by the workmen taking threads impregnated with poisonous dyes into the mouth (*cp.* Dental Cosmos, 1902, page 1287 "Case of Arsenical Necrosis from Colored Yarn Used in Cleaning the Teeth").

Actinomycosis also may be regarded as a disease peculiar to a calling—farmers who are in the habit of taking grains of corn infected with actinomyces in the mouth being the victims. It is generally supposed that these spores enter the organism by way of a diseased tooth. Actinomycosis appears as a very hard tumor in the jaws, exhibiting only slight tendency to softening. By way of prophylaxis farm-hands should be urgently warned against the dangers to which they expose themselves by chewing grains of corn. (See Dental Cosmos, 1908, vol. l, page 344, "Copper Sulfate in the Treatment of Actinomycosis.")

Glassblowers, too, are subject to typical affections of the mouth and teeth. Owing to the promiscuous use of their blowing-pipes syphilis is readily spread, whole epidemics thus originating having been noted. Dr. Max Scheir has also noted a peculiar abrasion of the incisors attributable to the use of the blowing-pipe.

PERISCOPE.

To Determine the Shade of an Artificial Tooth.—The tooth is put in its place and a large mouth-mirror is held behind it. In comparing with the neighboring teeth, the shades and contrasts are shown up very clearly.—*Deutsche Zahnaerztliche Wochenschrift.*

Solution for Local Anesthesia.—Novocain, 0.5 gram, physiologic serum 100 grams. This solution is slightly sterilized in the autoclave. Before using, add one drop of a 1:1000 adrenalin solution to four cubic centimeters of the anesthetic solution.—*Monde Dentaire.*

Method of Holding a Crown While Polishing.—Take an old-fashioned wooden clothes-pin and trim it down so that the open end will enter a crown (either molar or bicuspid) when pushed together. Simple, cheap, clean, and efficient.—G. A. Bowman, *Dental Summary.*

Burning of the Gums Under a Gold Plate.—The burning of the gums under a gold plate is due to either acid saliva, which can be corrected by alkaline mouth-washes, or to metallic amalgam or tin fillings in contact with the plate causing electric currents.—E. Kraus, *Zahnaerztliche Rundschau.*

Sinusitis in Complication with Influenza.—During the influenza epidemic of last winter, affections of the nasal sinuses were frequently observed. The bacteriological examination of the secretions revealed generally the micrococcus catarrhalis, never Pfeiffer's bacillus. The complication generally occurred at the beginning of the disease and most frequently involved the frontal sinus, while inflammations of the sinus sphenoidalis and of the maxillary sinus were rare.—*Muenchner Med. Wochenschrift*, per *Zahnaerztliche Rundschau.*

Choice of Filling Materials.—For teeth with very dense and very sensitive dentin use zinc phosphate—dependent upon the location—lined amalgam or tin; for teeth with very soft and sensitive dentin, gutta-percha, lined or unlined amalgam; for teeth with dense and not sensitive dentin, gold, tin, or amalgam; for teeth with soft and not sensitive dentin, gutta-percha, tin, or amalgam. Zinc phosphate or combinations of the filling materials mentioned, with pulp-cappings or intermediate fillings, may be used whenever indicated.—L. A. Faught, *Dental Brief.*

Restoration of Interproximal Space.—An abnormal condition that often requires correction by the insertion of a filling is that of the flat contact point as yet free from decay, but causing great distress by accumulating food particles, especially of a fibrous character, in the interproximal space. An occluso-approximal cavity should be formed, separation secured, and the correct contact supplied. In contouring with filling material, the result aimed at should not be the restoration of the original form of the crown so much as to preserve the proper form of the interproximal space and to prevent food from wedging into this area.—E. S. Packwood, *Dental Summary.*

Cleaning Burs.—Frequently burs or cutting instruments are cleaned with a rotary brush with steel bristles mounted on the engine. In these brushes, the sterilizing and cleaning of which is usually neglected, millions of bacteria from different mouths collect. It is therefore advisable to keep a dozen small toothbrushes with very hard bristles for that purpose, and to use a clean one for every patient. These brushes are cleaned by boiling in hot water and laying in a solution of lysoform. After vigorous shaking they are dipped in alcohol to accelerate their drying, and kept in a covered glass receptacle.—E. Paul, *Berliner Zahnaerztliche Halbmonatsschrift.*

Davis Crown with Cast Gold Base.—After adjusting the pivot and the crown to the root in the usual manner, the free surface of the root and the base of the crown are oiled. Then the pivot is put in place in the crown, some soft wax is poured over the under surface of the crown, and this is again fitted on the root. After chilling the wax, the crown is removed from the wax and the wax from the root. This is tried several times, until the line of contact is hardly perceptible. After removing the crown from the pivot and wax, the latter are invested, the wax is burned out, and cast. Before setting, the crown and cast base are cemented together. The same method can be applied for a banded crown.—T. L. Larseneur, *Bull. du Syndicat des Chir.-Dentistes.*

Sterilization of Aqueous Solutions of Chlorhydrate of Cocain.—The alterations which chlorhydrate of cocain in aqueous solution undergoes when being sterilized have been generally attributed to the effect of the heat and the alkalinity of the glass. Extensive tests with glasses of different alkalinity and various temperatures have yielded the following results: The decomposition of cocain is greater the greater the alkalinity of the glass. The heat has but a small influence. In receptacles of absolutely neutral material, such as cast silica, the cocain solution undergoes no alteration whatever, even in a temperature of 120° C. Sterilization at 120° C. in the autoclave has no harmful effect on solutions of chlorhydrate of cocain, if the alkalinity of the glass receptacle does not exceed that of three cubic centimeters of centinormal soda to every fifty cubic centimeters of capacity.—*Annales de Pharmacie*, per *Journ. Dentaire Belge.*

Painless and Bloodless Tonsillectomy with Descriptive Technique.—The author first applies 20 per cent, cocain in 1:1000 adrenalin to both tonsils. Then he injects a solution made up of about one-fifth of one per cent. cocain to which adrenalin is added (20 minims to the dram), in the following places: 20 minims in the supra-tonsillar fossa; 10 minims between the anterior pillar and the tonsil, between the posterior pillar and tonsil, and at the base of the tonsil. The patient holds down his own tongue with a Pynchon tongue-depressor. The tonsil is drawn toward the median line with forceps, and then freed on all sides with a knife. The tonsil is then severed with a Tydings tonsil snare, which has a pistol handle. It is necessary to thread this snare only once for both tonsils, as the wire is readily forced

back. Tannate of glycerin is applied to both cavities after removal, and the patient is told to gargle the throat with 15 minims of carbolic acid to eight ounces of water frequently for the first twenty-four hours, and then to alternate with hydrogen dioxid. The operative technique is the same under general anesthesia.—O. TYDINGS, *Journ. of Ophthalmology and Oto-Laryngology*, per *Amer. Journ. of Surgery.*

A Very Simple Method of Casting Small Bridges.—After the body of the bridge, which is to carry not more than five teeth, has been carefully modeled in wax, and from four to five wires, which are to serve in forming the vents, have been inserted, an iron or brass ring is filled with investment material consisting of one part of plaster and two parts of finely pulverized river-sand. The wax model is deeply pressed into the soft investment with the masticating surface downward. A space of about one-half square centimeter is left uncovered on the reverse side of the plate, the rest being covered with a cone of investment material in the center of which a funnel-shaped sprue-hole is kept open with a spatula. After burning out the wax and removing the wires, the gold is laid in the funnel and melted with a blowpipe. An asbestos sheet is laid on the molten gold, and the liquid metal is pressed into the funnel with a small hammer.—BEITINGHAUS, *Zahnaerztliche Rundschau.*

Wiring and Re-swaging a Gold Plate.—It is almost impossible to re-swage a gold plate in the usual way after the wire rim and the lugs for retention of the rubber attachment have been soldered on. By the following method this is entirely practicable, and the result is a glove-like fit unequaled by any other method:

After swaging in the usual way with die and counter-die the plate is trimmed to the desired outline, and the wire rim and lugs are attached. Then in the counter-die used for the first swaging a layer about one-fourth of an inch thick of Melotte's moldine is placed. The plate is put in position on the die and re-swaged lightly in the moldine. The moldine prevents the wire rim and the lugs from coming into contact with the metal counter-die, thus avoiding tearing or stretching the plate. This method is applicable also to re-swaging plates that have been worn so long that they need remodeling.—C. E. TALBERT, *Dental Summary.*

Alcohol and Dental Caries.—Dr. Floxas of Constantinople has examined the teeth of 729 Mohammedan workmen, 198 of whom were no longer total abstainers, with the following results:

Percentage of dental caries.

Ages.	Abstainers.	Non-abstainers.
15 to *20*	0.5	1.9
21 " *25*	1.0	3.7
26 " *30*	2.0	4.8
31 " *35*	2.7	7.2
36 " *40*	4.8	10.4
41 " *45*	5.4	11.6
46 " *50*	4.4	17.2

These differences are so striking, and the number of cases examined is so great, that these results cannot be simply accidental. Dental caries, besides many other symptoms of degeneration, is the result of chronic alcohol poisoning, alcohol of course not being the only enemy of sound teeth, but a specially obstinate one. Abstinence from alcohol, therefore, is not only a great and economic preventive of dental caries, but will have especially beneficial effects on the third and fourth generations.—*Deutsche Zahnaerztliche Wochenschrift.*

Usable Gold Plate from Gold Filings.—While the coarser clippings from the gold drawer may be melted under the blowpipe into a button, flattened and rolled into plate, the finer filings require preparatory treatment. They are apt to be contaminated with dirt and base metals, and if placed under the blowpipe for fusing, are usually blown away before fusing. First boil them in nitric acid until all red fumes disappear. Carefully pour off the acid and wash them with several changes of clean water. It is a wise precaution to filter the washings, as, if not carefully done, considerable gold may be lost by the fine particles floating off during this washing. Dry by a gentle heat, place them in a borax-lined crucible, and fuse in a gas furnace. If the quantity is small, the fusing may be done in one of the smallest size clay crucibles with the blowpipe, directing the flame under the crucible. When fused, if not more than a few pennyweights, let it cool in the crucible and forge the button flat, then use the rolling-mill. For larger amounts pour into an ingot mold. If the melt proves brittle, remelt, using as a flux sal ammoniac or corrosive sublimate. When using the latter be careful not to inhale the fumes.—W. H. TRUEMAN, *Dental Brief.*

HINTS, QUERIES, AND COMMENTS.

METHODS OF HARDENING A PLASTER CAST.

Apply a hot saturated solution of borax or alum with a brush, giving the cast two or three coats to insure a permanent hardening of the outer surface; then apply two coats of a hot saturated solution of barium chlorid, followed by two coats of soapy water, washing off the surplus soap with clear water. This process produces a hard surface that is insoluble in water, and which will preserve the cast indefinitely. If the plaster of Paris is mixed with gum arabic before the cast is made a coating will not be necessary, as the cast will be hard and durable and have a very smooth surface.

John Schembs, Jr.

Philadelphia, Pa.

OBITUARY.

DR. MILTON B. STRAIGHT.

Died, at his home, 80 West Huron st., Buffalo, N. Y., June 25, 1910, Dr. Milton B. Straight, aged seventy-two years.

At the time of his death Dr. Straight was the oldest practitioner in continuous service in western New York, he having commenced the practice of his profession in 1856, in Buffalo, where he remained until the time of his death. Dr. Straight was a son of the late Dr. Chester L. Straight, who was himself a dentist and formerly a student of the celebrated Dr. Gardette of New York city. Dr. Straight studied his profession in the office of his father, whom he afterward succeeded in practice.

In 1863 he formed a partnership with the late Dr. A. P. Southwick, which continued for about a year. In 1864 he assisted in the organization of the Buffalo Dental Association, becoming one of its charter members, and remained in active service in the society up to the time of his death. He was also a charter member of the Eighth District Dental Society, organized in 1869, and for sixteen consecutive years served the society as librarian. In 1888 he was elected vice-president, in 1889 president, and subsequently served on the board of censors for a number of years. In all these relations he served the society with rare fidelity and conspicuous ability. He early became a member of the American Dental Association, and subsequently merged his membership—at the time of the reorganization—in the National Dental Association, in which society he was an active member at the time of his death. As a practitioner of dentistry Dr. Straight was a man of high ideals, and was exceedingly conscientious toward his patients, from whom he exacted absolute fidelity. As an operator he stood among the very best in his profession, and never permitted himself to swerve from what he believed to be right. He did much for the advancement of the profession and was always a friend of the young man who desired to be an honest and clean practitioner.

For many years Dr. Straight was a member of the Academy of Natural Sciences, serving on the board of governors for a number of terms, and did much for the advancement of the academy. He was also a member and

greatly interested in the Buffalo Academy of Fine Arts, being a great lover of art, and spending much time with the oils and brushes; he was also interested in music and always patronized the best concerts. Socially Dr. Straight loved the society of cultured men and women, though always modest and retiring to a degree, regarding his own merits.

Dr. Straight was a member of the Buffalo Club, Park Club, and Oakfield Club. He was well known in Masonic circles, having been a member of Erie Lodge for nearly fifty years.

In 1870 Dr. Straight married Miss Mary Reed, who survives him. They had no children.

A dignified, courteous, and true-hearted gentleman was Dr. Straight, and greatly esteemed by all who had the honor of his personal friendship.

C. S. B.

DR. ALBERT H. BROCKWAY.

Died, at his home, 13 Greene ave., Brooklyn, Monday, June 21, 1910, Dr. Albert H. Brockway.

Dr. Brockway was of New England and Quaker stock and was born in Bridgewater, N. Y., in 1838. His early education was obtained at Summer Hill, N. Y., and in the public schools of Syracuse and Rochester, and he was graduated from the Rutgers College grammar school in 1854. He moved to Brooklyn in 1862, and maintained his residence there until his death.

Dr. Brockway was one of the founders and for a time president of the New York Odontological Society, and for three terms was president of the Brooklyn Dental Society, and at one time vice-president of the New York Institute of Stomatology. He was also a member of the American Dental Association, the Second District Dental Society, the Rembrandt Club of Brooklyn, the Portland Club, the Brooklyn Institute of Arts and Sciences, and the Brooklyn Library and Brooklyn Institute. He founded the Brooklyn Croquet Association. He was a member of the Second Unitarian Society.

Dr. Brockway for many years enjoyed a lucrative practice, and was regarded by his patients and his colleagues as not only a high-class operator, but as proficient in all departments of his professional calling. Kindly and genial in his disposition, he made many friends in the professional organizations with which he was connected, and during the active period of his professional society career was one of the leaders, with O. E. Hill, Wm. Dwinelle, W. H. Atkinson, and men of that class and period, who gave to professional dentistry in New York a status not second to that achieved by it in any other locality.

Dr. Brockway is survived by his wife and one son.

DR. CHAS. H. FIRMAN.

Died, suddenly, Dr. Chas. H. Firman, Wednesday June 1, 1910, at his home, 317 W. Clinton st., Elmira, N. Y.

Dr. Firman was born in Richfield, Otsego county, N. Y., and received his early training in the schools at Cortland, after which for some time he taught school in Canada, later studying dentistry with Dr. Hines, a prominent practitioner in Elmira. After completing his pupilage Dr. Firman entered upon the practice of dentistry, and afterward formed a partnership with Dr. Henry A. Moore, this relation continuing until the time of his death.

Dr. Firman was a highly respected member of the community in which he lived, and a successful practitioner of his profession.

He was a member of the Elmira Dental Society, which on Tuesday, June 14th, passed the following resolutions of respect to his memory:

Death has again invaded our society, and has removed the oldest practitioner of dentistry in this section—Dr. C. H. Firman—who died June 1, 1910, after a continuous practice of about fifty years.

As we gather at our annual meeting the vacancy is sensibly felt. We realize with sadness that our little circle is broken and a faithful member gone. Therefore, be it

Resolved, That in the death of Dr. Firman this society loses a valuable charter member who has ever been heart and hand with us in all things for the betterment of our profession; and be it further

Resolved, That we desire to express to his family our sympathy and sorrow, and that a copy of these resolutions be sent to his widow.

"IN MEMORIAM" RESOLUTIONS.

Dr. William Decker.

THE death of Dr. Wm. Decker of Oshkosh, Wis., on March 24th, was briefly noted in the COSMOS for June. The following resolutions were passed by the local dental society upon the loss of their comrade:

Whereas, The All-wise Ruler in His providence has seen fit to suddenly take from this life Dr. William Decker; therefore, be it

RESOLVED, That from the life of this member we can draw a lesson as from one worthy of emulation in his character as a genial, enterprising citizen, generous to a fault, one who, in his high standard as a dentist whose practice covered a period of nearly half a century, was always an industrious and an honest, painstaking practitioner; and be it

RESOLVED, That in his death we bow in humble submission to the divine will, and extend our sincere sympathy to the family; and be it further

RESOLVED, That a copy of these resolutions be sent to the family and that they be placed upon the records of this society.

M. L. CHRISTENSEN,
W. H. FORD,
C. C. NORRIS,
Committee.

DENTAL COLLEGE COMMENCEMENTS.

NORTHWESTERN UNIVERSITY, DENTAL DEPARTMENT.

THE annual commencement exercises of the Northwestern University, Dental Department, were held in Evanston, Ill., on June 8, 1910.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

David Hjalmar August
Arthur Edwin Baker
George Anthony Bantle
Ira Baughman
Ralph William Becker
Ernest August Beerman
Hyrum Bergstrom
George Walter Berndt
Charles Neil Black
J. D. Blackwell
James Kennedy Brimacombe
Benjamin Lyman Brown
Clifford Wahl Burkett
Reuben Julian Buss
Ford Leon Byers
Guy Campbell
Knute Paul Carson
Charles Hull Cartwright
George Burgeon Covert
Edgar Harper Crawford
Thomas James Crew
Epaminondas Dandelles
Thomas Jefferson Denney
William Lemmon Denton
George Hugo Dolby
Gustave Thomas Donovan
George Almond Downs
Marion Harvey Dugger
Philip Anthony Eckman
Harry Russell Farwell
Aldrich Fielding
Ashley Martin Firkins
Thomas Joseph Foley
Fred Lyman Forester
Marshall Edison Gates
Elsa Juliane Gerhold
Barney McCullough Gibson
Theodore Otto Goeres
William Allen Goode
Denzie Govett
Clarence Zina Graf
Roy S. Halderman
Lloyd Martin Hanson
Raymond Otto Heine
Charles Ulysses Hillweg
Edward Olaf Holm
Henry Claude Holmes
Walter Robert Host
Frank Burton Hudson
Albert Edward Joerin
Harry Whiteside Kelly
Will Eugene Kimbell
Sidney Barclay Knox
Walter Henry Kost
Frank Anderson Leonard
Roy Kay Lillie
William John Link
Lyman Augustus McBride
Christopher John Madill
George Herman Manosevitch
Henry Nankervis
Charles Brown Over
Eugene Irwin Payne
Lawrence Loraine Potts
Joseph Blaine Roe
Thomas Joseph Rowley
George Ellis Sandoz
Hjalmar Sederholm
Samuel Christian Shipstead
Carlton R. Smith
William H. Smith
Lyle Sargent Spencer
Dee Damond Stockman
Robert Lee Summers
John Thomas Symonds
Henry Robert Taecker
Robert Aldridge Thorley
Irl Jay Thornton
Roland Hill Todd
Carlos C. Valenzuela
Jacob Weinstein
Carl Ellsworth Wilbur
Fielding M. Wilhite
Elizabeth Ray Wilson
Walter LeRoy Wilson
Frank Ray Woods
John Edgar Wright

DRAKE UNIVERSITY, COLLEGE OF DENTISTRY.

THE annual commencement exercises of Drake University, College of Dentistry, were held in Des Moines, Iowa, on June 15, 1910.

The commencement address was delivered by Prof. James Lawrence Laughlin.

The degree of Doctor of Dental Surgery was conferred by the president of the university on the following graduates:

Oliver James Burgess	Missouri	Carl F. Huston	Illinois
Robert Miles Figg	Iowa	Robert Leon Martin	Iowa

STATE DENTAL COLLEGE, TEXAS.

AT the annual commencement exercises of the State Dental College, Texas, the degree of Doctor of Dental Surgery was conferred on the following graduates:

H. Beachum	Texas	J. A. Jay	Texas
J. W. Berthier	Texas	W. F. Kendrick	Louisiana
S. J. Creamer	Texas	H. H. Kent	Texas
J. L. Diffenbacher	Texas	W. R. Moody	Texas
J. A. Fenlow	Texas	A. C. Ortner	Texas
Neal Hamilton	Texas	G. R. Ritchey	Texas
C. F. Harris	Texas	J. D. Sibley	Texas
B. F. Hearne	Texas	T. W. Weaver	Texas
C. F. Huskey	Texas		

UNIVERSITY OF SOUTHERN CALIFORNIA, DENTAL DEPARTMENT.

THE thirteenth annual commencement exercises of the Dental Department of the University of Southern California were held in Temple Auditorium, Los Angeles, Cal., June 16, 1910.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Charles Grant Ashmore	Warren Matthews Hendrickson	William Aaron Riggs
Earl Lionel Clark	Hollis S. Jarvis	Robert Walters Schuessler
Joseph Pettee Copp	John Vincent Maile	Daniel Eugene Turrentine
Hugh Mortimer Davis	Ernest Michael Messner	Roy Meredith White
Maxwell Talbot Green	William Stoneman O'Connor	Milton Titus Whitmore

UNIVERSITY OF ILLINOIS, COLLEGE OF DENTISTRY.

THE ninth annual commencement exercises of the College of Dentistry, University of Illinois, were held in Handel Hall, Chicago, Ill., June 2, 1910.

The valedictorian was James A. O'Hora, D.D.S., and the doctorate address was delivered by George F. Butler, A.M., M.D.

The degree of Doctor of Dental Surgery was conferred by Edmund J. James, Ph.D., LL.D., president of the university, on the following graduates:

William Hayward Andrews	Lloyd Warner Latham	James Anthony O'Hora
Benjamin Isidore Berlin	Victor Lawrence Lee	Albert Max Rotzoll
Alonzo Strother Brock	Marie Meadow	Samuel Irwin Russakov
Alexander Cecil Browne	Mervil Lloyd Moomey	Harry Burns Snafer
William P. Coghlan	James Anthony McNulty	Frank James Smith
Rufus S. Farrier	Horace Edmund Metzner	Walter Leonard Taft
Hugh Alfred Larkin	Emil Ludwig Nordeen	George Henry Vann

TUFTS COLLEGE DENTAL SCHOOL.

The annual commencement exercises of Tufts College Dental School were held in Boston, Mass., June 15, 1910.

The degree of Doctor of Dental Medicine was conferred on the following graduates:

Louis Albert Badgley
Melville Crawford Bagnall
Frederick William Becker
Orville Thayer Bliss
Ernest Linwood Brown
Walter Eugene Burr
William Joseph Clegg
Fred Rich Crerie
Francis Henry Dean
George Herbert Dickinson
Timothy Joseph Donovan
Russell Ellis Dorr
Clark Otto Doubleday
James Alexander Dunlop
Melville Leroy Eldridge
John Royden Gilbert
Carolus Roy Given
Frederick Edward Grant
Louis Alfred Haffner
Francis Randolph Henderson
Philip Augustine Hennebery
Frank Hoy
Frederick Green Jellison
William Fownes Keith
Charles Patrick Kelly
John James Kneeland
Henry Keville Lambert
Edward Mark Lynch
Edwin John Morse
Alfred Warren Nash
René Lucien Petzoldt
Harold Charles Plaisted
Francis White Regan
Max Rosenthal
Israel Myer Shallen
Ernest Joseph Smith
Vincent Joseph Staples
Frederick Weeks Steadman
Anastasia Louise Sullivan
John Nathaniel Thomson
Jeffrey James Walsh

UNIVERSITY OF PITTSBURG, SCHOOL OF DENTISTRY.

The annual commencement exercises of the University of Pittsburg, School of Dentistry, were held in Carnegie Music Hall, Pittsburg, Pa., on June 15, 1910.

An address was delivered by Rev. Chas. Wood, D.D., of Washington, D. C.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Harry R. Balsinger
Joseph H. Beuchler
Daniel T. Bowers
Harry L. Briney
Ross W. Briney
Harry S. Connelly
Herman L. Eber
Samuel D. Emrick
James A. Fordyce
Oscar H. Goeddel
Wm. R. Hague
Reuben B. Hoover
Clyde R. Huston
Felix J. McParland
Chas. E. Manon
Geo. W. Reighner
Wm. R. Robinson
Benjamin M. Sapper
Harry M. Schwartz
Hilmar F. Sommers
Theodore Straub
Frank F. Waelde
Chas. H. Wine
Harry T. Workman

NEW ORLEANS COLLEGE OF DENTISTRY.

At the annual commencement exercises of New Orleans College of Dentistry, held in New Orleans, La., the degree of Doctor of Dental Surgery was conferred on the following graduates:

L. R. Adams	Louisiana
R. L. Bennett	Texas
A. B. Bland	Louisiana
W. J. Boudreaux	Louisiana
L. B. Bourg	Louisiana
J. M. Brumfield	Louisiana
J. Burleigh	Louisiana
E. A. Bush	Mississippi
H. J. Chauvin	Louisiana
J. A. Collins	Louisiana
L. Dehon, Jr.	Louisiana
E. B. Ducasse	Louisiana
L. G. Duke	Louisiana
C. H. Frick	Louisiana
C. W. Gibbons	Louisiana
T. J. Hargrave	Mississippi
A. B. Karpe	Louisiana
R. G. Larrieu	Cuba
R. E. Lee	Louisiana
A. A. Leefe	Louisiana
O. L. Loeffel	Louisiana
L. U. Marchand	Louisiana
C. C. Melancon	Louisiana
A. J. Perrault	Louisiana
W. C. Pratt	Louisiana
L. P. St. Amant	Louisiana
O. J. Trappey	Louisiana
S. F. Vildosola	Cuba
J. E. Wagley	Louisiana
T. J. Walters	Louisiana
A. White	Louisiana

GEORGE WASHINGTON UNIVERSITY, DENTAL DEPARTMENT.

At the annual commencement exercises of the George Washington University, Dental Department, the degree of Doctor of Dental Surgery was conferred on the following graduates:

Louie W. Butterfield ...Iowa
Melville Palmer Eslin...District of Columbia
Thomas Hoffman .....Massachusetts
Maurice Hurwitz .....Massachusetts
James Norris Robinson .....West Virginia
Raphael Sherfy .....Pennsylvania

BIRMINGHAM DENTAL COLLEGE.

At the annual commencement exercises of the Birmingham Dental College, the degree of Doctor of Dental Surgery was conferred on the following graduates:

R. J. Barnett, E. E. Beard, G. M. Caraway, A. W. Haden, R. M. McGlathery, W. S. Malone, J. W. Ogletree, T. Patten, J. C. Putnam, W. A. Richardson, F. C. Rush

WISCONSIN COLLEGE OF PHYSICIANS AND SURGEONS, DENTAL DEPARTMENT.

The annual commencement exercises of the Wisconsin College of Physicians and Surgeons, Dental Department, were held in the Plymouth Congregational Church, Milwaukee, Wis., on Tuesday, June 7, 1910.

The commencement address was delivered by President Samuel Plantz of Lawrence College.

The degree of Doctor of Dental Surgery was conferred by President Carrier on the following graduates:

Arnold Block .....Wisconsin
Frank Mayr .....Wisconsin
Frederick Puls .....Wisconsin
Frank F. Schlueter .....Wisconsin

UNIVERSITY OF MICHIGAN, DENTAL DEPARTMENT.

The annual commencement exercises of the University of Michigan, Dental Department, were held in Ann Arbor, Mich., June 30, 1910.

The commencement address was delivered by Rev. Wm. H. P. Faunce, D.D., LL.D., president of Brown University, on the following graduates:

John Henry Ahrens
Mark Lowell Baker
George Samuel Bakewell
William Asa Barringer
Frederick Raymond Beardsley
Clyde Ernest Brant
Leon Edward Broadbooks
Frank Coleman Cady
Russel Opdycke Calkins
James Gordon Campbell
George William Corns
Walter James Covieau
Charles Mossgrove Cummins
Frank Ensminger Davidson
Bernard George DeVries
Ward Lorenzo Fickey
Guy Willis Fitzgerrell
Elisabeth Johanna Floeter
Arthur Hewey Forsyth
James Ulric Gallagher
Edgar Louis Giffen
Howard Burrier Grant
Clarence Carson Johnson
Clifford Grinnell Johnson
William Elwin Johnson
Frederick Grant Kirkland
Margaretha Christina Knapper
Walter Edward Lotz
Percival Chelston Lowery
Michael James McKenna
Allen McLaughlin
Clarence William Messinger
Leonard Earle Murray
Robert Gustavus Olson
Martin Webster Prince
Julian Kennedy Quinby
Loretta Sadie Rempes
Bert John Riepma
Frederick Grover Rogers
Garland Chester Ross
George Stuart Roth
Theodore Christian Schwartzbek
Judson Franklin Selleck
Claude J. Smith
John Anthony Sommer
Herman Andrew Stobbelaar
Charles Lewis Thomas
Leslie Henry Weber

HARVARD UNIVERSITY DENTAL SCHOOL.

THE annual commencement exercises of Harvard University Dental School were held in Sanders Theater, Cambridge, N. Y., on June 29, 1910.

The degree of Doctor of Dental Medicine was conferred on the following graduates:

J. Aisner	L. Diez	D. J. McCarty	G. A. Pease	D. Siegel
D. J. Alexander	B. Finkelstein	C. F. MacDonald	J. F. Place	A. T. Wing
J. W. Canady	L. E. Knight	J. T. McGlynn	F. E. Schwartzbord	S. A. Wodell
S. E. Davenport	R. M. Knight	N. H. Malmstrom		

WESTERN RESERVE UNIVERSITY, DENTAL SCHOOL.

THE seventeenth annual commencement exercises of Western Reserve University Dental School were held in the Euclid Avenue Presbyterian Church, Cleveland, Ohio, on June 16, 1910.

An address was delivered by Andrew Sloan Draper.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Walter Harrison Albaugh	Lucy Gertrude Hoffman	George Howard Phelps
Elia Caplin	Herbert Charles Jelley	Walter John Pryor
Bernard Henry Cooper	James Gordon Lowe	Abraham Joseph Smally
Evan William Davies	Thomas Leo Manning	Oscar Elsmere Stanton
Jacob Walter Farver	Carl L. Mehl	Henry Steuer
Harry Ginsburg	Walter Ernest Nick	Joseph Kerr Watson
Jay Milton Hisey	Myles Edward Perry	

SOCIETY NOTES AND ANNOUNCEMENTS.

VIRGINIA STATE DENTAL ASSOCIATION.

CHANGE OF DATE OF MEETING.

THE forty-first annual session of the Virginia State Dental Association will be held at Staunton, Va., August 3, 4, and 5, 1910. The change of date is made on account of the meeting in July of the National Dental Association.

Every effort is being made to make this the most interesting and successful meeting of our society. Men of national reputation will give clinics and read papers. All ethical practitioners are cordially invited to attend.

For exhibit space, rates, etc., address the manager of the Virginia Hotel, Staunton, Va.

W. H. PEARSON, *Cor. Sec'y*,
Hampton, Va.
J. W. MANNING, *Ch'm Ex. Com.*,
Norfolk, Va.

HARTFORD DENTAL SOCIETY

Memorial to Dr. Horace H. Hayden.

[SEE FRONTISPIECE.]

ON June 25, 1910, the Hartford Dental Society held dedication exercises for a monument which the society has had erected in his native town of Windsor to Horace H. Hayden, the father of American dental surgery.

The monument was the proposal of Dr. Andrew J. Flanagan of Springfield, and the work was carried out by a committee composed of Drs. Albert E. Cary, A. J. Flanagan, James McManus, Geo. O. McLean, F. T. Murlless, and Chas. McManus.

The memorial is of colonial red brick with a stone base, 4 feet square at the base, 3½ feet square at the top, and 11½ feet high. It is surmounted by a lamp of artistic design, and bears a memorial inscription on bronze

tablets. It was designed by Dr. Chas McManus of Hartford, Conn., son of Dr. James McManus, who unveiled it.

The dedication was made the occasion of the annual outing of the Hartford Dental Society, and the program consumed the entire day. The Tunxis River Canoe Clubhouse at Windsor was made headquarters, where a shore dinner was served at 12.30 o'clock, followed by a social hour.

The exercises were held near the monument at 3 o'clock, and were presided over by Dr. A. E. Cary, president of the Hartford Dental Society. Short addresses were delivered by Dr. James McManus, Dr. A. A. Hunt of Hartford, and Dr. A. J. Flanagan of Springfield. Dr. J. W. Harper read an original poem.

Dr. B. Holly Smith, the chief speaker of the day, dwelt on the life and work of Horace H. Hayden, through whose untiring efforts were originated the three essentials of professional beginnings—a college, a national society, and a journal.

AMERICAN MILLER MEMORIAL.

All dentists at home and abroad are debtors to the late W. D. Miller, whose scientific mind, untiring energy, and pride in American citizenship have been potent factors in placing this country at the head of the profession.

Let the old adage, "A prophet is not without honor save in his own country," be the exception in this instance, and let every loyal American be represented in a lasting memorial to his useful life.

The proposed bronze will be erected in the capital city of his native state, that he may share the well-merited distinction of being one of our greatest men.

The invitation to contribute is extended individually and collectively through the societies of the country, and your support, both moral and financial, is urgently solicited.

Executive Committee—Edward C. Mills, Columbus, Ohio; J. R. Callahan, Cincinnati, Ohio; S. D. Ruggles, Portsmouth, Ohio.

In order that the work may be quickly and efficiently accomplished, contributions may be sent direct to the Treasurer of the American Miller Memorial Fund.

Weston A. Price, *Treasurer*,
10406 Euclid ave., Cleveland, Ohio.

ARMY DENTAL CORPS.

Memorandum of changes of stations and duties of contract dental surgeons, U. S. Army.

For the week ending June 25, 1910:

Robert T. Oliver, examining and supervising dental surgeon, June 14th, returned to Fort Hamilton, N. Y., from temporary duty at Fort Hancock, N. J.

Charles J. Long, June 9th, reports for temporary duty at Fort Andrews, Mass.

George I. Gunckel, June 12th, reports for temporary duty at Fort Screven, Ga. Left Fort Barrancas, Fla., June 10th.

Robert T. Oliver, examining and supervising dental surgeon, June 18th, will proceed to the camp of instruction to be held at Gettysburg, Pa., to arrive July 1st, for dental service during the encampment.

Charles J. Long, June 21st, ordered to proceed at the proper time to Pine Camp, Jefferson co., N. Y., for dental service during camp of instruction.

For the week ending July 2d:

George H. Casaday, June 18th, ordered to proceed to Fort Baker, Cal., for temporary duty.

R. M. Hollingsworth, contract annulled June 20th.

E. E. Ingalls, June 25th, left Fort Douglas, *en route* to Fort Duchesne, Utah, for temporary duty.

Robert T. Oliver, examining and supervising dental surgeon, June 28th, granted two months' leave of absence, to take effect on or about July 1st. (Order to proceed to camp of instruction at Gettysburg, Pa., is revoked.)

Robert F. Patterson, ordered to proceed from San Francisco, Cal., to Fort Sheridan, Ill., for station and duty.

For the week ending July 9th:

Wm. G. Hammond, June 29th, relieved from duty in the Philippines Division and directed to sail on transport to sail from Manila, P. I., about September 15th, to San Francisco, Cal. Dental Surgeon Hammond will proceed thence to his home, and upon ex-

piration of the leave of absence granted him this date will report to the Surgeon-general of the Army for annulment of contract.

Leave of absence for three months, to take effect upon arrival in the United States, is granted Dental Surgeon Hammond.

Geo. I. Gunckel, July 3d, *en route* to Fort McPherson, Ga., from temporary duty at Fort Screven, Ga.

For the week ending July 16th:

Edwin P. Tignor, July 7th, granted twenty days' leave of absence about July 15th.

Geo. I. Gunckel, July 6th, left Fort McPherson, Ga., on twenty days' leave of absence.

R. F. Patterson, July 9th, reports for duty at Fort Sheridan, Ill.

Minot E. Scott, July 8th, returned to Vancouver Barracks from temporary duty at Fort Lawton, Wash.

Geo. H. Casaday, July 8th, reports for temporary duty at Fort Baker, Cal.

Franklin F. Wing, July 11th, left Fort D. A. Russell, Wyo., on one month and twenty days' leave of absence.

For the week ending July 23d:

Alden Carpenter, July 15th, left West Point, N. Y., on thirty days' leave of absence.

Charles J. Long, July 18th, left from temporary duty at Fort Andrews, Mass, *en route* to Fort Rodman, Mass., for temporary duty.

Minot E. Scott, July 5th, upon completion of temporary duty at Fort Worden, Wash., will return to station at Vancouver Barracks, Wash.

VERMONT STATE DENTAL SOCIETY.

ELECTION OF OFFICERS.

AT a joint meeting of the Vermont and New Hampshire Dental Societies, which was held at Rutland, Vt., May 17 to 20, 1910, the Vermont State Dental Society elected the following officers for the ensuing year: A. Z. Cutler, Bennington, president; L. E. Mellen, Middlebury, first vice-president; F. H. Brown, Enosburg Falls, second vice-president; Harry F. Hamilton, Newport, secretary, and W. H. Munsell, Wells River, treasurer. Executive Committee—Dana E. Dearing, South Royalton, Thomas Mound, Rutland, and W. H. McGoff, Montpelier.

HARRY F. HAMILTON, *Sec'y*,
Newport, Vt.

HARVARD DENTAL ALUMNI ASSOCIATION.

ELECTION OF OFFICERS.

AT the thirty-ninth annual meeting of the Harvard Dental Alumni Association, held in Boston, Mass., June 27, 1910, the following officers were chosen for the ensuing year: Waldo E. Boardman ('86), Boston, Mass., president; Frank T. Taylor ('90), Boston, secretary, and Harold De W. Cross ('96), Boston, treasurer. Member of Executive Committee (for two years)—Norman B. Nesbett ('99), New Bedford, Mass. (The above-named officers constitute the Council.) Nomination and Election of Officers Committee—Elbridge A. Shorey, Dover, N. H.; Chas. T. Warner, Boston, and Amos I. Hadley, Boston.

WALDO E. BOARDMAN, *Sec'y*,
Boston, Mass.

UNITED STATES PATENTS

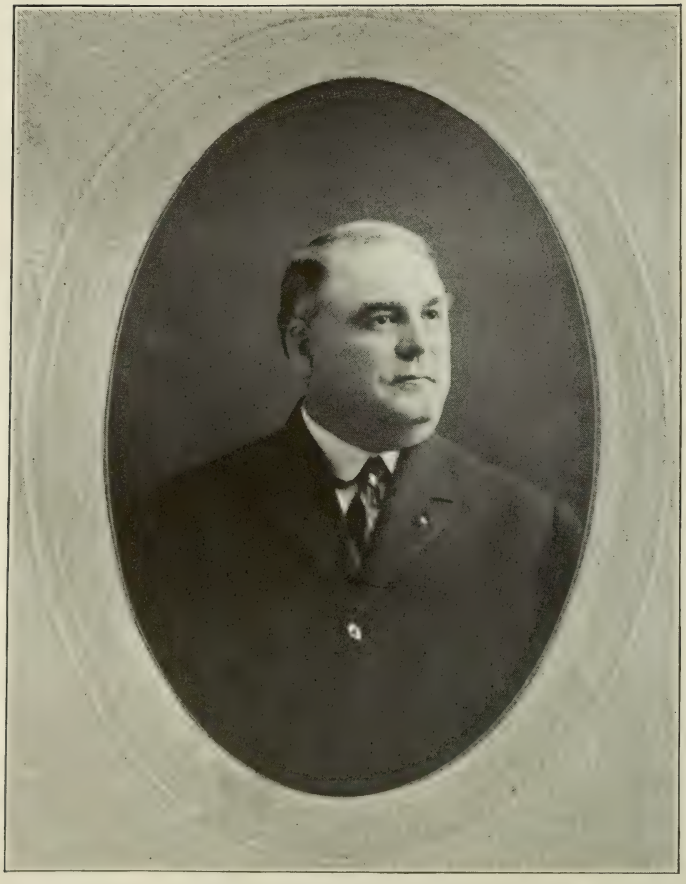
PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JUNE 1910.

June 14.

No. 961,262, to MAX R. SLOUGH. Dental advertising device.

No. 961,287, to FRANK M. CRANE. Process for treating ulcerated teeth.



DR. W. H. TODD.

THE

DENTAL COSMOS.

VOL. LII. SEPTEMBER 1910. No. 9.

ORIGINAL COMMUNICATIONS.

INCIDENTS IN THE PRACTICE OF AN ORAL SURGEON.

By TRUMAN W. BROPHY, M.D., D.D.S., LL.D., Chicago, Ill.

(Read before the Southern Branch of the National Dental Association, Houston, Texas, May 4, 1910.)

A SUBJECT which will always demand the attention of the dentist, and one with which he must become familiar, is *pain*. Pain originates from many different causes; to be able to recognize the sources of pain is one of the most important considerations in making a diagnosis.

DIFFICULTY OF DIAGNOSIS IN REFLEX PAIN.

Frequently in cases of pulpitis the pain is located by the patient in some part quite remote from the center of disturbance. Not infrequently pain from an exposed dental pulp will manifest itself in the supra-orbital branch of the fifth nerve above the eye, or it may be transmitted to the inferior dental branch, and seem to be localized in the mental foramen. Pain that has originated in other parts of the body may sometimes manifest itself in the different branches of the fifth nerve and impress the patient that the teeth are responsible, when close examination reveals no dental lesions and nothing that would lead the examiner to locate the pain there; so pain may have its origin from a source that is extremely obscure, and thus may baffle the highest skill in making a diagnosis.

It is necessary for me to state that the chief causes of such pain as is presented for treatment to dentists are pulpitis, pericementitis, results of infections which terminate in dento-alveolar abscesses, periostitis, excementosis, the presence of pulp-nodules within the root-canals, imperfectly adjusted artificial dentures, crowded arches, impacted teeth, and some others of minor origin.

To make a diagnosis of almost all of these conditions is comparatively easy, but in making a diagnosis of neuralgia which may have its origin from some of the conditions just named, complications which are not so easily discovered must often be taken into consideration.

DIAGNOSIS OF TRIGEMINAL NEURALGIA DUE TO DENTAL LESIONS.

Among the most aggravating types of trigeminal neuralgia, the one which causes the patient the greatest distress is that due to dental lesions. A patient appears in the clinic whose teeth have been cared for carefully, no evidence of dental caries being present, no tenderness of the surrounding tissues on percussion of the teeth; yet the patient complains of pain in the region of the first and second lower bicuspids, which teeth on examination are found to be sound. Inquiry is made as to the habits of the patient, his occupation, the question of poisoning from phosphorus, arsenic, lead, etc. These possible factors are eliminated. Further examination reveals a second molar with a dead pulp. We see no cause for acute pain from this tooth; there is no soreness present, and we do not see how this tooth could produce such acute pain. Then we come to the realization that ocular examination, information from the patient, the use of all the means at our command thus far employed, have failed us. We still have another measure which we can employ to assist us in locating the source of the trouble, and that is the skiagraph. If the skiagrapher has done his work thoroughly, we may find at a glance the origin of the pain. It may be a chronic abscess at the apex of a root of the diseased molar, which, as we have mentioned, has discharged directly into the inferior maxillary or dental canal, the pus coming in direct contact with the nerve being the cause of this neuralgic pain. We may find, in the pulp, nodules which by exerting pressure on its nerve filaments might cause the pain. We may find, back near the angle of the jaw, a third molar impacted, directing pressure on the inferior maxillary nerve, thus causing pain.

We may find the upper third molar diverted from its proper position and driven backward through the tuberosity of the jaw, exerting pressure on the posterior dental nerves, thus causing pain. We find supernumerary teeth here and there producing pressure on nerves and becoming sources of pain. There are many causes of nerve-pain in this nerve region aside from that easily seen on examination.

Since diseases of the teeth are more prevalent than any other disease to which mankind is subject, we find many other diseases having their origin in them. Within the domain of the practice of the rhinologist comes chiefly the treatment of diseases of the accessory sinuses to the nose. We realize the remarkable improvement that has been made in the science of medicine during the last quarter-century, and yet those of us who have been trained in the fields of dental and oral pathology are impressed with the fact that errors of diagnosis are not infrequently made by physicians who are called upon to treat diseases in the mouth and about the face which have originated from diseased teeth.

DIAGNOSIS OF DISEASES OF THE ANTRUM OF DENTAL ORIGIN.

One of the most striking examples to prove the truthfulness of the above assertion is found in the treatment of the diseases of the antrum of Highmore. This cavity, by reason of its anatomical relationship to the teeth, and in view of the great number of dental abscesses which occur, becomes infected from these abscesses. I believe 85 per cent. of all cases of empyema of the antrum have originated from dento-alveolar abscesses. The close proximity of the roots of the teeth to the floor of the antrum, the passage of these roots, sometimes, directly into it, being covered only by pericementum and mucous membrane, makes it quite clear to all that in the event of the formation of an abscess at the end or ends of the roots, the pus would surely make its exit into the antrum. This pus becomes a source of irritation to the mucous membrane lining the antrum, and leads to the general breaking down of the walls, or at least of the mucous membrane. A sense of fulness, pressure, headache, general languor—which is due to absorption—and general infections are

observed during the acute stage. The passage of pus through the aperture between the antrum and the nose, discharging through the anterior nares or posteriorly into the pharynx, is noticed, and many cases are treated for nasal catarrh.

The rhinologist, in studying the origin of the disease, often does not take the teeth into consideration. Irrigation of the nose is of little value; it will give some temporary comfort in relieving the parts of the secretions, but the source not having been reached, pus will continue to form.

Treatment. A patient who is suspected of having antral abscess may be managed in the making of a diagnosis in this way: Let him lie with the suspected diseased side on the pillow and retain that position as well as he can during the night; in the morning turn the head over quickly, and if the opening between the nose and the antrum has not been closed, a copious flow of pus will at once take place, and this will be convincing that the antrum is diseased. If the head is pushed forward, the pus will escape from the nose. Use the same treatment on the other side, and there will be no flow of pus as before from the antrum, as there is no accumulation. If it be decided that the antrum is diseased and that an abscess exists, providing it is a recent case, a small aperture may be made in the anterior wall and the antrum flushed out by means of a small pointed syringe which may be introduced. This treatment, if given two or three times, will effect a cure. Of course the teeth, if any are diseased and responsible for the abscess, should be treated and cared for as though the abscess had not been formed. They should be treated on general principles, treating the canals and filling them, and retaining the teeth; but if the teeth are of no value, only loose roots being left, these should be extracted.

If an antral abscess becomes chronic, on the antrum walls polypi will have developed, which must be removed. I find that in almost all cases of chronic antral abscess polypi are found. In the event, then, of chronic abscess, the one course to pursue that will make the operator sure of the condition and enable him to effect a cure upon which he can rely is to make a large opening through the anterior antral wall, clear out the polypi, and pack the antrum with gauze, allowing the gauze to remain for forty-eight hours, when it should be removed and the antrum irrigated and examined with a small incandescent light, which will readily pass in, thus enabling the operator to ascertain the exact condition of the parts. Progressing in this way the operator will be able to treat his patient with a distinct understanding of the condition of the parts and of the progress that is being made from time to time. The opening into the antrum may be maintained by a plug, preferably of gutta-percha shaped so that it will not slip in, by having a flange on the outside. This plug may be removed from time to time and the antrum irrigated. The opening should be large enough to allow of the introduction of a finger, and to afford easy access for the accomplishment of the work required.

CYSTS.

In our clinics there are many patients afflicted with cysts in and about the maxillary bones;—mucous cysts, dentigerous cysts, retention cysts, and ranula being some of the most pronounced types that come before us constantly.

Mucous cyst. A mucous cyst is simple, forming in the mucous membrane, and needs to be opened and freely cauterized. This treatment administered once is generally sufficient to remove the cyst.

Ranula. Ranula or cyst of the salivary ducts conveying the saliva from the submaxillary and sublingual glands, differs from the simple mucous cyst. Ranula is due to stoppage of Wharton's ducts, arresting the passage of saliva from the submaxillary glands. This stoppage of the ducts is due to either the formation of salivary calculus within the duct or to inflammation at the orifice of the duct, which causes adhesion and closure. The

pressure of deposits of salivary calculus within the duct may be detected by digital manipulation; if that fails, a skiagraph will show clearly the pencil-shaped deposit in the duct, which stops the passage of the saliva. If the stoppage is due to adhesions, of course no deposits of calcium salts should be observed. A ranula may be simple, having only an accumulation of fluid within it, or it may be complicated, accompanied by a neoplasm. The neoplasm is due to the irritation caused by the pressure of fluid against the surrounding walls of the cyst.

A simple ranula, one not attended with a growth surrounding it, should be opened in such a way as to allow the fluid to escape, and the opening must be maintained to avoid a recurrence of the cyst. If a ranula is merely punctured, allowing the fluid to escape, the opening will heal and there will be a recurrence of the cyst. To establish a permanent opening I have made use of a silver tube with many openings made in it. This is introduced into the sac, passing out at another point, forming a ring by telescoping one end of the tube with the other. The perforated tube-ring allows the saliva to enter the sac and make its exit outside the sac. (See Fig. 1.) This also establishes a permanent opening, as the tissues become glazed over with membrane surrounding the ring. After the lapse of about two weeks the tube may be removed, when it is found that these permanent openings will allow the passage of saliva freely.

In the event of a growth accompanying the cyst no other treatment will effect a cure than the thorough removal of the growth with the cyst. This sometimes involves the submaxillary and sublingual glands. If the glands are enlarged to a very great extent, they may have degenerated so that their removal will be necessary.

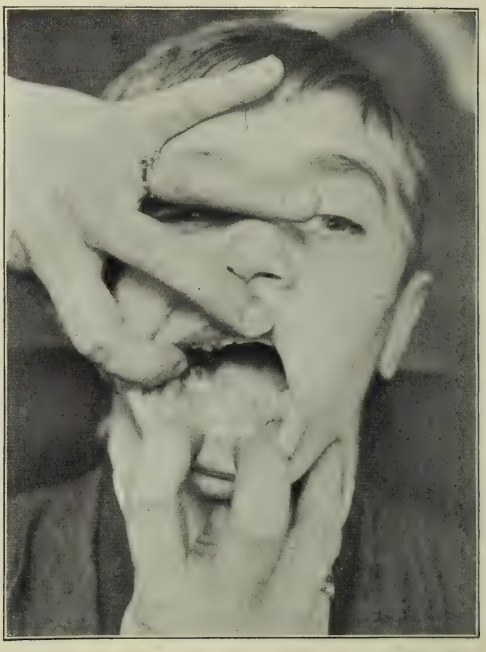
Dentigerous cysts. Fig. 2 is the photo-

Fig. 1.



Simple ranula.

Fig. 2.



Dentigerous cyst.

graph of a patient showing quite clearly the conditions prior to the removal of a dentigerous cyst. The boy came to my clinic with his cheek greatly distended, as a result of the formation of this cyst. A skiagraph revealed the presence of the lower right lateral incisor, cuspid, and two bicuspids within this cyst. The external wall of the cyst was completely removed, together with the entire surrounding membrane which formed the wall of the cyst. The cyst contained a great quantity of brown-colored fluid filled with cholesterin. The bone was absorbed to such an extent that it was extremely thin, making the removal of the cyst and contents a risk, as there was danger of fracturing the thin plate of bone remaining. We succeeded, however, in making a satisfactory operation.

A dentigerous cyst, it is unnecessary to state, has as its nucleus one or several teeth. The teeth may be deciduous, permanent, or supernumerary ones. On examination a permanent tooth might be missing. In that event we have something of a clue as to the origin of the cyst, though this is not reliable. If supernumerary teeth are the cause, we have no way of knowing of their presence. The only reliable means at our command to enable us to make an accurate diagnosis is the skiagraph, as by this means we are able to locate exactly the tooth, and it is a matter of importance, oftentimes, to know how many teeth the cyst contains. With this information we are able to make an accurate diagnosis. It is essential to remove every vestige of membrane lining the cyst, else there may be a center about which the cyst may recur.

Differential diagnosis between a cyst and aneurysm. In making the diagnosis of a cyst it is first necessary to make use of an exploring needle, drawing off some of the fluid to determine its character. In differentiating between a cyst and an aneurysm it is to be noted that an aneurysm is not infrequently developed in the posterior palatine artery in the region of the tuberosity of the jaw. Of course, in an aneurysm there is pulsation, while in a cyst there is none. Nevertheless it is always wise to use an exploring needle before opening any cavity containing fluid.

Oral tumors. It is unnecessary to call attention to the many classes of oral tumors, but only a few of those which are the most prevalent will be mentioned. Those which most frequently come under our observation are the benign tumors known as epulis, and the malignant tumors, carcinoma and sarcoma.

FIG. 3.



Epulis.

Epulis. Epulis is classed among the benign tumors. At its origin it is unquestionably benign, although it may under certain conditions take on a malignant form, if it has been allowed to develop. It should not be neglected and should not be tolerated, though it does not cause any marked inconvenience to the patient until it has reached considerable size. It is a well-known fact that it has its origin from the periosteum. It extends up between the teeth and around them, separating them, takes on a bright red appearance, and bleeds very readily on the slightest friction. Fig.

3 illustrates the growth appearing between the teeth of a young girl, upward toward the cutting edges.

Error is frequently made by cutting off these edges. Epulis means "upon the gum"—*epi,* "upon" and *ulis,* from *oulon,* "gum." While it seems to be seated on the gum, it has its origin on the periosteum just at the neck of the tooth or teeth, and involves the gum in its growth. It is therefore a tumor of fibrous character. It is most generally to be found anterior to the molar teeth, although it may involve the tissues anywhere back as far as the angle or tuberosity of the jaw. It is not self-curing, and the removal of the portion above the gums will always admit of its recurrence. The only treatment that will effect a cure is the removal of the growth, together with the periosteum from which it originates, with some of the bone underneath it. It is possible to do this sometimes without removing the tooth adjacent to the growth, though in some cases it is necessary to remove the tooth or teeth, as the pericementum sometimes is involved in the growth, and no other treatment can be employed that will permanently remove the diseased tissue. As in the development of most tumors, the development of epulis is the result of an irritation.

Carcinoma and sarcoma. It is unnecessary to state that accumulations of salivary calculus, the adjustment of bands to teeth that extend up too far, artificial dentures, etc., may cause irritation at the neck of the teeth sufficient to cause a multiplication of cells.

The prevalence of malignant growths in the mouth is not difficult of explanation. Anything that will produce irritation of the mucous membrane will lead to the multiplication of cells. The multiplication of cells will lead to a growth, and further irritation of the growth will lead to further growth, and so this irritation to which the mouth is so subject by reason of any irritation set up about a tooth is the cause of the development of these tumors in many cases.

AN EDUCATIONAL CAMPAIGN NEEDED.

Really, an educational campaign should be started to teach people how to avoid irritation of the mucous membrane. They do not realize the danger to which they are subject.

From my experience, which extends over many years of private, clinic, and hospital practice, I can state without the slightest hesitancy that nearly all cases of malignant growths can be traced to some irritation which has been neglected. In the largest cities of our country great progress has been made for the last year in devising plans for securing care for the teeth of school children. It has been my duty as chairman of a committee in Chicago to be in conference with the superintendent of the schools and the health commissioner, and to arrange plans by which the 176 schools of Chicago may be supplied with examiners and dentists to care for the worthy poor of Chicago, while the others are urged to apply to the family dentist for the care that they so much need.

The average father and mother do not know the importance of caring for the teeth of children. They do not know the difference between deciduous and temporary teeth. With the work that we have started, the children will be impressed with the importance of having their teeth cared for before they are lost by disease. In this we will succeed to a very great degree, and a large percentage of the cases of trigeminal neuralgia, general infection, formation of tumors, and other diseases of the face will be eliminated by education of the children in regard to the importance of dental care. Furthermore, the question of oral prophylaxis will be so thoroughly impressed upon the people that in a few years' time a marked improvement will be found in the teeth of the youth of Chicago.

We must not forget that any irritation may be the beginning of a malignant growth.

ARE THE "NEW SCHOOL ORTHODONTISTS" PRACTICING EXCESSIVE EXPANSION?

By A. H. KETCHAM, D.D.S., Denver, Colo.

(Read before the Southern Branch of the National Dental Association, at Houston, Texas, May 4, 1910.)

WHEN the principle of treating cases of malocclusion by placing each and every tooth in normal or ideal occlusion was given to the profession by Dr. Edward H. Angle, about eight years ago, there were some who questioned the truth of the principle, and many others who doubted its practicability. Even those who have accepted and practiced this principle doubtless have treated cases in which the advisability of its application in its entirety has seemed questionable from the point of facial art.

UNFAIR CRITICISM OF MODERN ORTHODONTIA.

I will confess that in some of my earlier cases, where I expanded the arches to the maximum, the result at the time of retention would seem to justify the criticisms of our old friends, namely, that by our excessive expansion of the dental arches we would produce too great a protrusion of the lips. The criticism also made that after the ordeal of such expansion our patients would be left nervous wrecks needs no answer, for the orthodontist who possesses the skill, coupled with the love for children which gives him the patience and tact to treat these cases successfully, soon acquires the requisite judgment enabling him to carry on his work with so slight a degree of discomfort to his little patients that the majority increase in weight and height, improving in general health to a greater degree than ever before in their lives.

The advocacy of extraction of one or more teeth in young patients on account of the strain imposed upon the patient's nervous system during the operation of expanding the arches, is merely a confession of a lack of the necessary skill, patience, and tact for treating orthodontia cases successfully.

DR. E. S. TALBOT'S CRITICISM.

The above criticisms, so often made years ago, have come to light again in the March issue of the DENTAL COSMOS, in an article entitled "Rip Van Winkles in American Dental College Faculties," by Dr. Eugene S. Talbot of Chicago. He also gives the impression that the upper first bicuspids may be sacrificed to allow unerupted canines to "come down," and that this may be done without detriment to the occlusion of the teeth, or to the facial lines, but actually with great benefit when compared with the expansion of the arches produced in order to make room for the retention of the normal number of teeth. While Dr. Talbot may have seen some cases which have caused him to form this opinion, yet it is no more fair to judge a method of treating cases of malocclusion by a comparatively small number of crudely treated cases than it is to condemn all cast fillings because a number of imperfect ones are placed in the teeth, or to condemn all hammered gold fillings because so many have proved failures. Such an article from a person who poses as a critic of teachers, but who displays such gross ignorance of the development of the dental arches and the oral and nasal cavities, as well as the face, and of the very foundation of all dentistry

—namely, occlusion—leads us to suspect that a Rip Van Winkle may have reawakened in the rôle of critic.

SOME CASES OF EXTREME EXPANSION.

I will show a few cases in some of which extreme expansion was practiced, and I must confess that in at least one of these, when the regulating appliances were removed, we had a "bimaxillary protrusion."

FIG. 1.

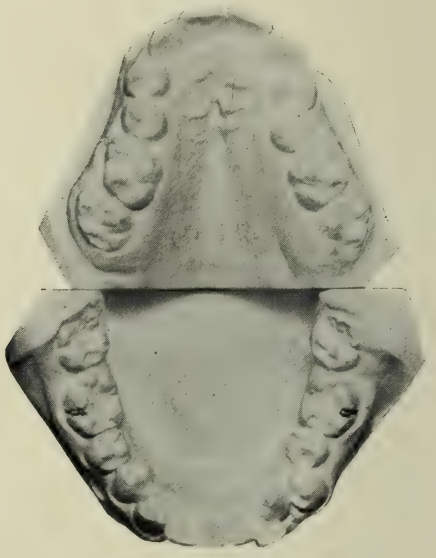


I will endeavor to present the facts in an unbiased way, and allow you to decide whether or not in these cases, by retaining the full complement of teeth and treating for normal occlusion, we have obtained the best results, not only from the dental and nasal points, but in facial art as well, or whether the ultimate result, dental, nasal, and facial, taken as a whole, would have been better had we sacrificed a tooth or two, as indiscriminately advocated during the dark ages of orthodontia, and sometimes today.

FIRST SUCCESSFUL STAGES OF TREATMENT OF A CASE OF EXPANSION.

In the case illustrated in Fig. 1 we have a boy of fourteen years of age, who is below the average in physical development, whose enlarged tonsils were removed at six years of age and adenoids one year later, but not until they had accomplished their baneful work in retarding not only the growth of the nasal space and of the dental arches, but of the whole anatomy of the boy as well. His lips would be called full enough, unless we remember that at fourteen years of age, when all the teeth with the exception of the third molars have

FIG. 2.

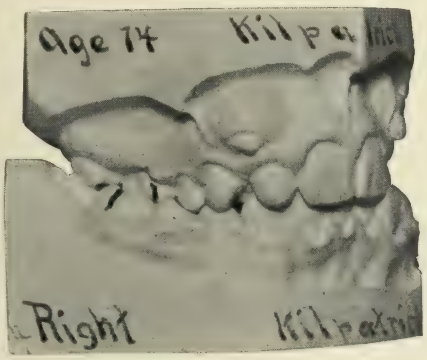


erupted, the lips should be quite full, almost protruding, in relation to the balance of the face. The width of all of the erupted teeth is as great as it ever will be, and the rest of the face has not nearly completed its growth, but under normal conditions will continue to increase in size for a number of years, until the apparent fulness of the lips in comparison with the rest of the face will have disappeared.

When treatment was begun (Fig. 2), this boy could not walk upstairs, ride a bicycle, nor run without breathing through his mouth. His rhinologist, Dr. T. E. Carmody, reported that the nasal space was about one-half normal, and that the septum was deflected. The condition of the under side of the thin plate

of bone separating the oral from the nasal cavity was fully as bad. The distance between the upper second bicuspids

Fig. 3.



at the gingival line was but 73/100 of an inch. All the upper teeth with the exception of the canines and second molars were in lingual positions in relation to the line of occlusion, while the teeth in the lower arch (Fig. 3) were in distal occlusion and quite irregular.

Extraction of two or more bicuspids would have been our only resource a few years ago, before Dr. Angle proved that after expanding the arches to normal size, by moving out the crowns of the teeth, the roots follow, and that in two or three years' time the roots and alveolar process will be in normal labial and buccal positions. Treatment by extraction was accepted before we knew it would leave the nasal space without its normal development, with the upper arch constricted, with an inefficient masticating apparatus and poorly nourished body.

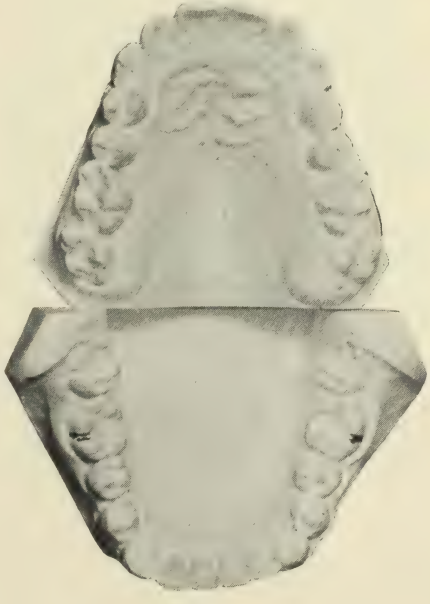
Expansion was decided upon without a moment's hesitation. (See Fig. 4.) All the teeth were placed in harmony with the line of occlusion, the lower being moved forward until the mesio-distal relations of the two arches were normal. The tooth movement was completed in about eight months' time. The boy did not suffer, but gained in weight and health during the operation, and was in the best of spirits, as an instance will show: One day he came into the office with his face flushed and covered with perspiration. I found upon questioning him that he was feeling so good over his

Fig. 4.



improved breathing that he had run the entire distance from his home to the office, about two miles, and had kept his

Fig. 5.



mouth closed, breathing entirely through the nose—and be it remembered that Denver is 5000 feet above the level of the sea. (See Fig. 5.) Shortly after the retainers were placed upon the teeth

he went again for examination to the rhinologist, who reported that the nasal space had increased in size until it was, as nearly as he could judge, seven-eighths of normal, and that the deflected septum had been nearly straightened. All this was accomplished by expanding the upper arch about 51/100 of an inch.

Fig. 6.



Fig. 7.



Fig. 8.

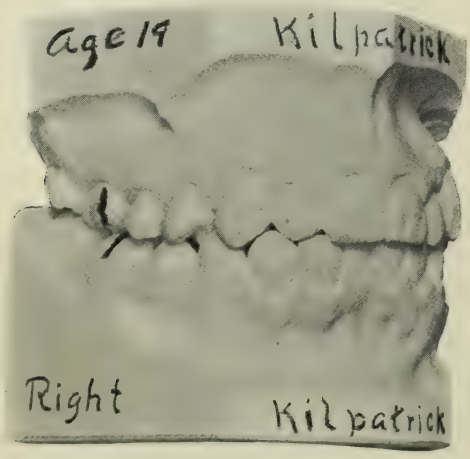


Fig. 9.



Apparently "Excessive" Expansion.

All this sounds very well and the occlusion of the teeth is beautiful, so we decide never to sacrifice another tooth. But, on seeing the face illustrated in Figs. 6 and 7, with the lips puffed out as though the boy were blowing into his cheeks, do we not feel that perhaps, after all, the man without the knowledge of

occlusion, but with a good strong grip upon his forceps, might be right?

This young man went to another state to live, and was seen two or three times a year at first, during retention, when some slight adjustment of the retainers would be made. Returning during the Easter vacation just passed, after a year's absence, we find the teeth in the positions

FIG. 10.



FIG. 11.



shown by the models (Figs. 8 and 9), about three and one-half years since the retainers were first applied. You will see that the occlusion of the teeth has remained very good indeed. The roots (Fig. 10) of all the ten anterior upper teeth have moved outward and there has been considerable "bone-building," as described by Dr. Angle as taking place in these cases. In the next illustration (Fig. 11) we have sections of the upper arches between the second bicuspids and the first molars, before treatment, immediately afterward, and as they are now. You will note the tremendous increase in size which has taken place along anatomical lines, just as nature intended these arches to develop. Dr. Carmody has drawn from his charts and memorandum of the case an outline of the nasal cavity on each of the models as it appeared at that date. His report is: "Nasal space, March 1906, before orthodontic treatment, one-half normal, deflected septum, slight adenoid tissue present. After treatment, December 1906, space about seven-eighths normal, septum almost completely straightened." April 1910, three and one-half years after orthodontic treatment, he reports: "Nasal space fully normal." A year ago the slight adenoid tissue was removed, and the inferior turbinates were trimmed slightly.

FINAL PERFECT RESULTS.

What of the face? Have those baboon lips protruded more and more

from this "excessive" expansion? It is said that "The proof of the pudding is in the eating"—so the last photograph will tell the story. (Fig. 12.) This illustration shows what our friends who advise extraction have been forgetting, namely, that when all the teeth are put in occlusion, and harmony is established in the balance of all the forces brought to bear upon them, the child is bound to develop and improve in general health, in growth, and in beauty, to an extent which would have been utterly impossible if the case had not been treated, or, what is fully as bad, had been mutilated.

Fig. 12.



Notice the strong lines of the face—the chin, showing determination, the firm lips, and their balance with the nose, forehead, and cheeks—and remember that for two or three years longer the upper two-thirds of the face will continue to grow and develop, because up to fifteen years of age it did not have a fair chance, but was stunted and dwarfed; then imagine the further improvement which will take place. The boy is now nearly a sixfooter and quite likely will attain a development almost as great as that of his father, who is above six feet, weighing over two hundred pounds, and having broad, beautiful dental arches.

Fig. 13.

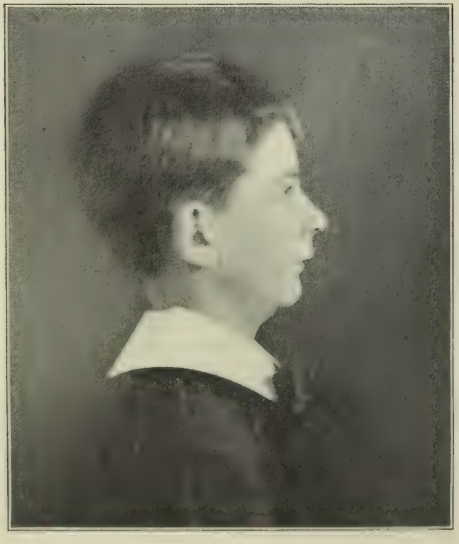


Fig. 14.



A CASE OF PROTRUDING UPPER INCISORS AND RETREATING CHIN.

The next case is one of that type of mouth-breathers which is so often seen, with protruding upper incisors and retreating chin. (Fig. 13.)

The usual advice in such cases at one time was to wait until the age of twelve or fifteen years—or until the case was almost as bad as could be—before having it treated. It has now been proved to the satisfaction of the great majority of orthodontists that the best time to treat these cases is even before the eruption of the permanent teeth, when the two arches may be placed in their normal mesio-distal relations, and sufficient expansion secured so that the permanent teeth may erupt normally, and the nasal cavity also develop normally, and before this deformity of the features has become so pronounced. The boy was eleven years of age when treatment was begun. (Fig. 15.) In six months' time the teeth were placed in occlusion by moving the lower teeth forward and the upper back, and expanding both arches. (Fig. 16.)

Fig. 15.

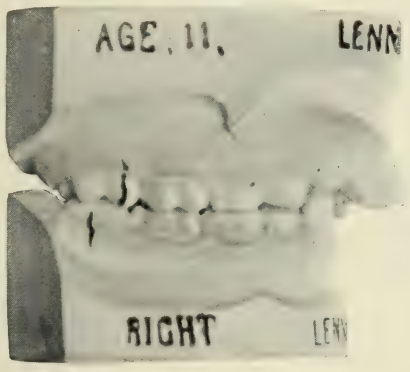


Fig. 16

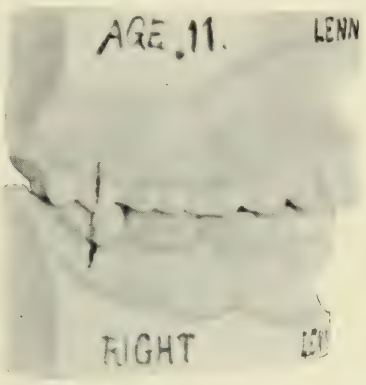
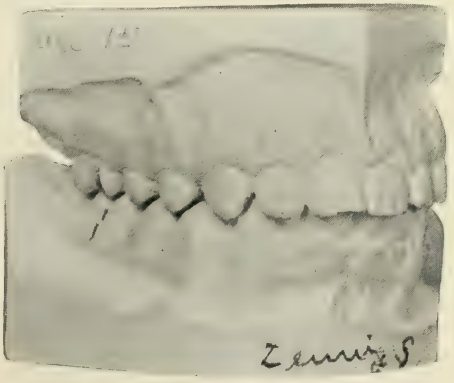


Fig. 17.



Fig. 18.



In the second photograph (Fig. 14) the improvement in the facial lines may be noted, while Fig. 17 shows the improvement in the features four years after treatment. Nature has not forsaken us; the upper lip is not protruding, and the chin and lower lip have improved in strength. The models of the teeth made in July 1909 (Fig. 18), four years after treatment, show that they are in normal occlusion, and when we say "normal occlusion," or "ideal occlusion," we have said everything.

Fig. 19.

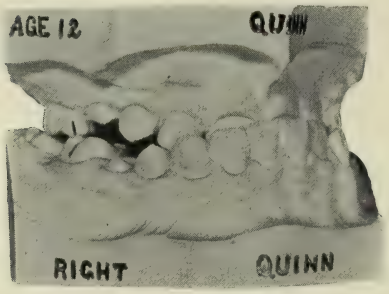


Fig. 20.

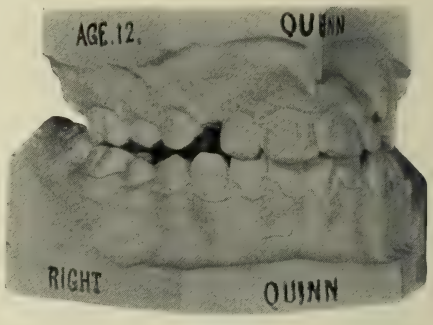


Fig. 21.

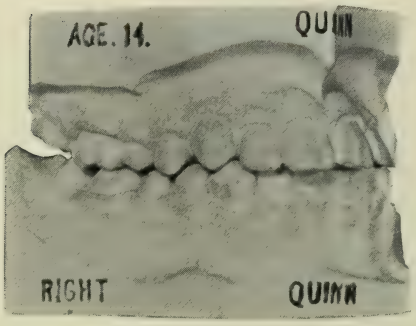
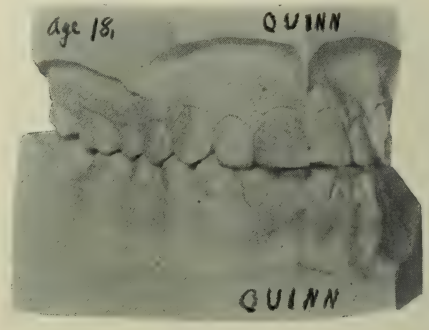


Fig. 22.



A CASE OF RETRUDING UPPER INCISORS WITH COMPLICATIONS.

In the third case (Figs. 19 and 20) we have the models of a girl, twelve years of age, whose upper permanent incisors when erupting were caught on the lingual side of the lower incisors, but the molars were in normal mesio-distal relations. A dentist was consulted at that time, and the old advice was given of waiting until all the permanent teeth with the exception of the third molars should be in place. The patient followed that advice for some years, until she fell into the hands of a better-informed dentist and was referred to an orthodontist, who moved the upper incisors out over the lowers. The case was then allowed to rest for about six months, or until the canines made their appearance, when the appliances were replaced upon the upper and lower teeth, both arches expanded to their normal size, and the upper canines moved down into place by gentle pressure. When this was completed and the teeth were in normal occlusion the upper incisors slanted outward at quite an angle (Fig. 21, made on June 10, 1905), because over the roots

bony development was lacking by several years' growth, but models made in July 1909 (Fig. 22) show that the roots of all the anterior teeth have moved outward, with the alveolar process filling out nicely.

The flat upper lip before treatment, due to the lingual positions of the teeth beneath it, is shown in Fig. 23. The full appearance of the lower half of the upper lip after treatment, and the lack of development around the corners of the nose and the upper half of the lip is shown in Fig. 24.

FIG. 23.



FIG. 24.



FIG. 25.



FIG. 26.



The next photographs (Figs. 25 and 26) show what a great change has taken place in three and one-half years, which elapsed between completion of treatment and the taking of these photographs. A strengthening of the face as a whole is noted. The development of the upper lip and around the base of the nose is pronounced. The reason for this is that by normal occlusion and the normal balance of forces, including normal lip pressure, the apices of the roots have moved forward, and there has been a filling-in of bone in this region, nature doing her best to make up for lost time. The last of the retainers was removed from this case about two years ago.

Fig. 27.

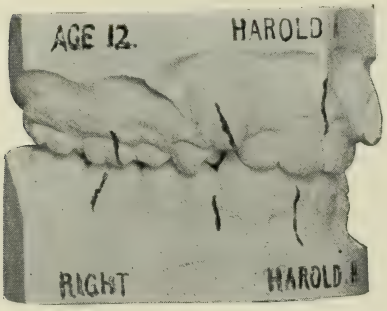


Fig. 28.

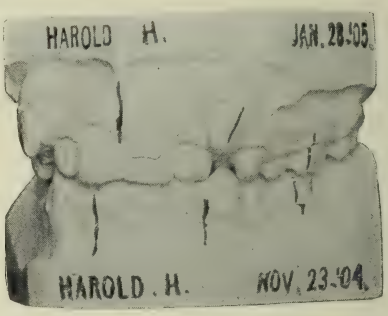


Fig. 29.

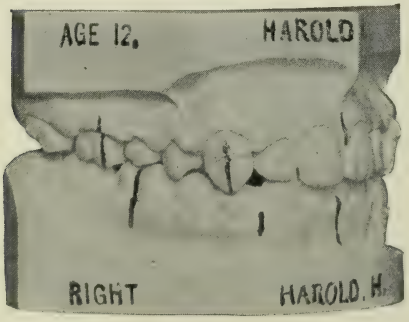
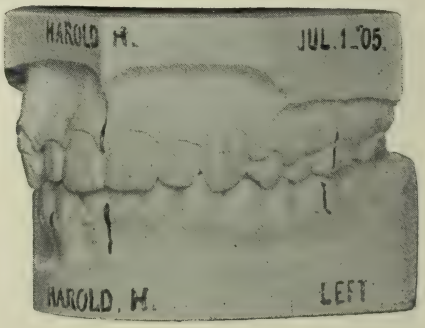


Fig. 30.



EXTRACTION FOR CORRECTION OF MALOCCLUSION ALWAYS CONTRA-INDICATED.

Many men, when they extract one or more teeth in cases of malocclusion, claim that the others have been left in good articulation, or with a good "working" articulation. I want to state emphatically, that there is no good "working" articulation of the teeth unless they are all present and in ideal occlusion—of course the third molars may be excepted. A person may get along and do fairly well with an inefficient masticating apparatus, but that same person would do infinitely better and be better nourished, or at any rate nourished with less effort, if he had an ideal occlusion of the teeth. A four- or six-cylinder automobile cannot be efficiently driven when one or two cylinders are missing; but a vast number of people are going around missing one, two, or three dental cylinders, and wondering why they do not feel up to par.

A CASE OF DIFFERENT MASTICATING EFFICIENCY ON THE TWO SIDES OF THE JAWS, DUE TO ILL-ADVISED EXTRACTION.

In the next case (Figs. 27–41) there is occlusion upon the right side of the

mouth, which before treatment was very similar to that often described as "a good working articulation" by the men who advise extraction, and after treatment the "good working articulation" is just as efficient, but no more, than it was before treatment. On the left side of the mouth, each occlusal inclined plane on each and every cusp meets its grinding mate just as nature intended, giv-

FIG. 31.



FIG. 32.



FIG. 33.

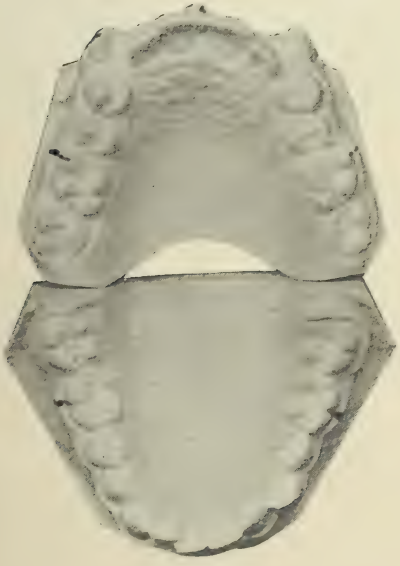
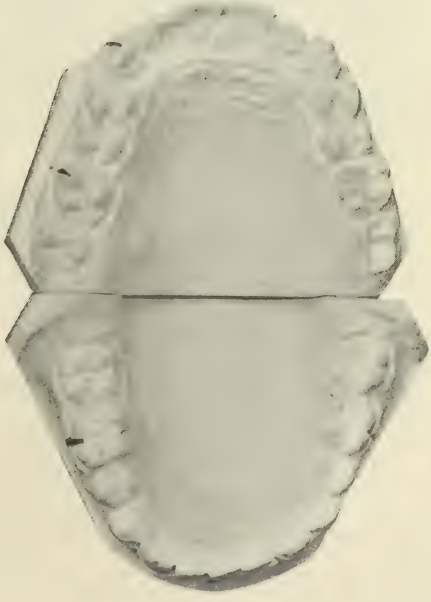


FIG. 34.



ing efficiency in the grinding of food. This was the side of the mouth which was used in the preparation of food for the stomach, because it did the work well, while on the right side the cusps did not occlude as nature intended, and therefore a large cusp was trying to grind food in too small a depression, and a small cusp in a large depression; or, in other words, the "mill-stones" were not mates, and therefore did not do efficient work. The reason for this is apparent; the right lower is in distal occlusion, while a lower incisor is missing, due to an attack of forcepitis when the dentist discovered an incisor erupting lingually. The effect on the face (see Figs. 31 and 32) was to develop the muscles of the left cheek more than those of the right. It is seen in the patient's profile that his lips are nearly full enough; how can we expand the arch to normal without protruding the lips until they approach the prehensile type? From the lingual surface of the models (Figs. 33 and 34) it will be seen that the upper arch was expanded until there was room enough to bring the canines into place, and to place the balance of the teeth in harmony with the line of occlusion; the lower jaw was expanded with the idea of gaining normal space for the missing incisor, which later could be replaced by an artificial substitute. But before treatment was completed the plans were changed, the incisors and the right canines were moved to the left, and then the molars and bicuspids on the right side forward, until they were mesial to their normal positions by the width of one cusp. The case was retained with the teeth occupying these positions, and the writer thought it quite a clever operation.

Fig. 35.

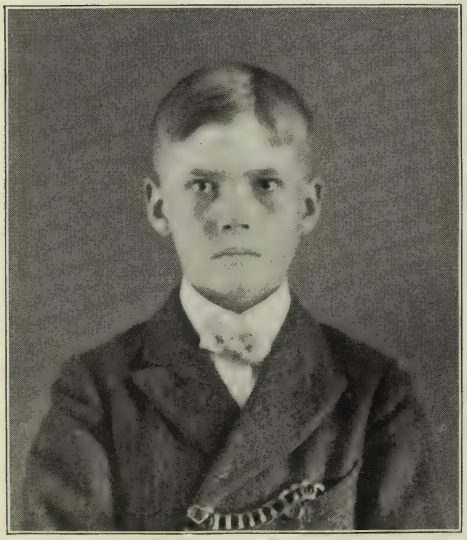


Fig. 36.



It will be noticed from the photographs taken at the time of retention (Figs. 35 and 36) that both sides of the face at that time were well developed, though the right was not as good as the left, and that the lips were not protruding too much. The models made recently (Figs. 37–39), four years after treatment, show that the case was retained successfully. It required but very little attention during retention. Photographs of the face made about one year ago (Figs. 40 and 41) show that the patient's profile is strong and beautifully balanced, while the full face shows that the masticating efficiency of the teeth upon the right side of the mouth is not nearly so

good as that upon the left; that the muscles of mastication upon the left side have increased in development, while those upon the right have not done so to so great an extent, which proves that this young man finds the masticating apparatus upon the normal side of his mouth much better suited to his needs than that upon the one with the "good working articulation." For the last year he has tried faithfully to use the right side of his mouth as much as the left, but has not succeeded in increasing the development of that side of his face to the point attained by the normal side. I can sympathize with this young man, for in my own mouth the buccal teeth are in normal occlusion upon the right side, and do efficient work, while upon the left side they are in end-to-end "antagonism," and only punch holes through the food without grinding it and preparing it for the stomach. If I place a juicy piece of broiled steak between the teeth upon the left side, they just punch holes through it, feel lame, and the steak seems rather tough and stringy, but when transferred to the teeth on the right side of the mouth the meat is crushed finely, the juices are extracted, and thorough enjoyment is derived from the food.

A portion of food is improved fully 100 per cent. for nutritive purposes, when, after having been masticated as thoroughly as possible upon the inefficient side, it is transferred to the normal side and masticated properly.

Fig. 37.

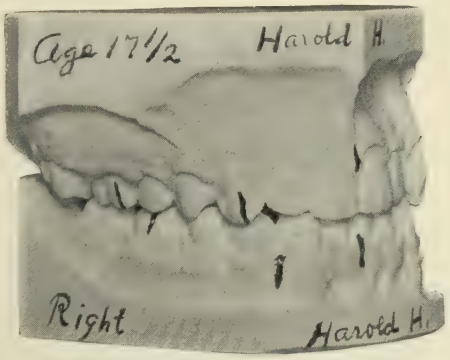
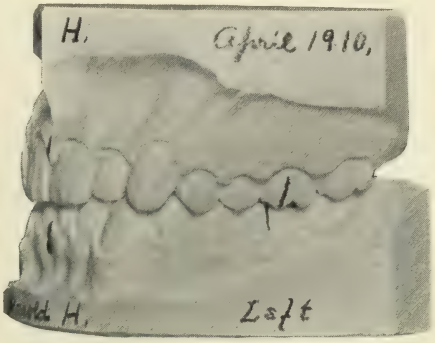


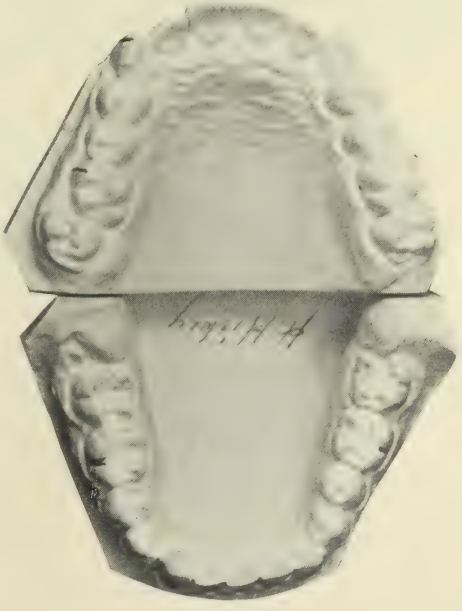
Fig. 38.



DELETERIOUS EFFECTS OF EXTRACTION.

I can truthfully say that by extractions performed in order to prevent nervous strain during orthodontia treatment, or to prevent protruding lips, we in reality

Fig. 39.



are starting the patient on his journey through life inadequately prepared to meet the demands upon his strength; we are inviting nervous breakdown, because such persons are the victims of an inefficient masticating apparatus and usually lack in normal breathing. The facial lines, too, are badly mutilated by extraction; this may not be apparent at first, but as soon as maturity is reached, the lack of development of the dental arches becomes painfully apparent. There are thousands of men and women all around us with weak lips and faces, due either to lack of treatment or to the extraction of one or more teeth, performed in a futile attempt at the correction of malocclusion.

Fig. 40.



Fig. 41.



PRINCIPLE OF ORTHODONTIC TREATMENT.

In closing I wish to state the principle upon which all these cases but one were treated—the principle according to which practically all orthodontia cases are treated today—the principle which was given to us by Dr. Edward H. Angle. It is that "The best balance, the best proportion of the mouth in its relations to the other features, require that there shall be the full complement of teeth and that each tooth shall be made to occupy its normal position—normal occlusion" —and I might add that the same principle applies if we would have the most efficient dental apparatus and the best general health and development.

DENTAL SERVICE AS A PUBLIC HEALTH MEASURE.

By EDWARD C. KIRK, D.D.S., Sc.D., Philadelphia, Pa.

(Read before the Susquehanna Valley Dental Association of Pennsylvania, at its annual meeting, at Harvey's Lake, May 24, 1910.)

THE general interest which both within and outside the ranks of the dental profession is now being manifested in the care of the teeth as a health measure may be properly regarded as the most significant development which has occurred within the history of the dental profession. Heretofore, as a profession, we have been mainly concerned with the study of the science and art of our craft, and the development of a sound technique for combating the dental disorders that we are called upon to treat. Today we are facing a new problem which is opening up new fields of activity and larger sociological relationships than we have previously been called upon to assume. We are asked to step out from the limitations of practice upon a selected *clientèle* and accept the responsibilities and larger professional rewards which are the portion of those who are, in their class and degree, guardians of the public health.

The present widespread interest in dental hygiene is by no means confined to the dental professional ranks, nor can its public aspects be regarded wholly as a reflex of professional activity. Several factors have apparently contributed to the general interest in this question. Upon the side of the public there has been for a number of years an increasing interest shown in the betterment of health conditions. As medical science has uncovered from time to time the sources of disease causation, there has arisen the coincident effort to attack the disease problem not only upon the therapeutic side, but upon the prophylactic side as well. The discovery of the tubercle bacillus, the study of its growth conditions and methods of propagation, have revolutionized our ideas as to the treatment of tuberculosis and brought into effective practice a variety of forms of treatment, the majority of which are based upon the fundamental conception of so increasing the natural resistive agencies of the body that the tubercular invasion may be and is overcome by raising the general health standards of the infected individual.

The discovery of the disease-propagative activities of the yellow-fever mosquito and the common housefly has led to a war of extermination upon these pests, with the coincident education of the public into a wholesome respect for the germ origin of disease and the necessity for bodily hygiene as a means for preventing disease invasion. Moreover, the legalized slaughtering of infected food-animals, the scientific inspection of animal carcases intended for human food, and the legal restrictions now generally in effect with respect to the adulteration of food products of all kinds, the sanitation of dwellings and public buildings, etc., have each in their way served to focus public attention upon the importance of avoiding impure or infected food in order to avoid the penalty of disease causation which such use necessarily entails. In addition to these more striking examples, the activities of numberless organizations dealing in a special way with a variety of aspects of the general betterment work have contributed largely to the spreading of information on health questions, so that today the necessity for hygienic living as a pre-

ventive of disease may be regarded as common knowledge upon the part of the public. On the professional side, the increasing recognition of the importance of hygiene has reached a point where it seems that from the standpoint at least of scientific medicine, the interest in preventive medicine has outstripped interest in the therapeutic aspect of medical work.

In connection with the study of disease causation, the human mouth has been subjected to the same type of scientific investigation which has characterized research in other directions. The work of Miller, originally undertaken in Koch's laboratory, established the fact that the buccal cavity is the breeding-ground of many varieties of bacteria having pathogenic properties, and that as a source of infection an unhygienic mouth is of major importance in that it constitutes the breeding-ground and is the portal by which the larger proportion of disease-producing germs find entrance to the body. The brilliant research of Miller, which resulted in his demonstration of the active cause of caries, seems to have overshadowed, in the dental mind at least, the other facts which he established regarding the mouth as an avenue of infection. We have concentrated our attention so strongly upon combating the ravages of caries that we have not recognized at its full value the importance of maintaining hygienic mouth conditions as a prerequisite of good health.

It is now about twenty-five years since the importance of preserving the teeth as a public health measure began to attract serious attention, especially in Europe. The alarming prevalence of dental caries and the evident evil results directly caused by the destruction of the masticating mechanism from tooth decay attracted the attention not only of dentists, but of physicians as well. In Great Britain a systematic study of the mouth conditions of public school children revealed the alarming fact that only three or four per cent. had sound dentures, and that dental caries was an evil that was undermining the health of the nation. Similar studies in other countries furnished statistics which in general corresponded with the figures obtained in England, showing that dental caries is a disease practically universal in its distribution and constituting a factor of ill health second in importance to no other which affects the human race.

Among the evil consequences of dental caries, the damage wrought by the disorder to the masticating mechanism was self-evident, and the train of nutritional disorders directly due to inability to properly masticate the food were quickly recognized. Chronic dyspepsia, intestinal indigestion, and the auto-intoxication caused by absorption of bacterial waste products developed in the fermenting masses of imperfectly masticated and infected food were striking examples of pathological conditions having their origin in a damaged masticating mechanism. But the evils resulting from imperfect masticating were by no means the only pathologic sequelæ of dentures damaged by caries. Further studies of the bacterial side of the question, notably by Hunter of London, furnished unquestionable evidence that decayed and diseased teeth were incubators of a variety of pathogenic germs which, proliferating in and about carious teeth, found their way into the body, causing various disease reactions, many of them of a most serious and often fatal character. Among the pathogenic germs which thus invade the body are the various pus producers, the bacillus tuberculosis, actinomyces, the pneumococcus, Vincent's streptococcus, and a variety of others, each of which is the known cause of serious disease. The discovery of these facts has given an added importance and significance to oral hygiene as a means for conserving the bodily health and as a prophylactic against disease invasion. To stem the tide of this destructive influence there has developed from small beginnings a movement which today is practically universal, and which involves, generally speaking, the collaboration of the dental and medical professions, educational authorities, social workers, and all who are concerned

with the betterment of civic and social health conditions.

So active is the movement and so enthusiastic are its several promoters that there are evidences of danger that in some directions it may defeat its avowed purposes by the very exuberance of its growth. The enthusiasm with regard to dental hygiene and public dental service cannot be expected to sustain itself at its present intensity unless the results attained justify its continuance. Intelligent direction, based upon a clear comprehension of its possibilities, is required in order that the new movement shall make a substantial and continued growth. It is doubtful if education of the public or of public school children as to the importance of dental hygiene will alone be sufficient to maintain indefinitely such an interest as will induce the majority to give persistent care to their mouths and dental organs. Nor is it probable that the interest in this question now manifested by the dental profession will continue sufficiently active to induce large numbers to devote their time and energies to the service of the public gratuitously for an indefinite period of time.

The novelty of the situation will in time become worn off, and when public dental service becomes a commonplace of the social order, as it is certain to become in time, some definite and proper basis of practical organization of the work must of necessity be provided in order to establish it upon a firm foundation and provide for its continuance. The present, then, should be regarded as the formative period of the work, a period in which opportunity is given to our profession to demonstrate its efficiency in public dental hygiene service and the crying necessity for such service as a public health measure. During this formative period, the greater part of the service must of necessity be gratuitous, but in order that it shall become fixed as a permanent part of the general system of health measures now essential to the public weal, the care of the teeth of public school children, and of all those who are for the time being wards of the state, must eventually be placed under state direction and be done at public expense. It is therefore proper and wise that in our efforts to organize the present activities in relation to public dental service, we should as definitely as may be possible endeavor to affiliate the movement with the public health activities in all cities and towns having organized health departments.

It is not necessary to more than allude to the tendency which has arisen in various ways to commercialize this movement, as the tendency is doubtless familiar to all of you. Nothing can so quickly neutralize the advantages of this movement, both to the public and to the dental profession, as to furnish grounds for the suspicion that our claims regarding the beneficial character of this service as a public health measure are but a cloak to cover the commercial activities of the dealer in dental supplies or of the nostrum-vender. The taint of suspicion of commercialism has already served to weaken the movement in various ways and in several localities. In the work of inspection of public school children large dependence must in the beginning be placed upon the collaboration of public school teachers, simply because of the difficulty of securing the means and machinery for expert and adequate inspection of all school children by those fully competent to do the work of inspection. Because of this necessary dependence upon the teacher and because of her lack of technical knowledge it will follow that at first only the most obvious cases of dental or oral trouble among the pupils will be sought out and relieved. But the cases of this class, ordinary toothache, dental irregularities, uncleanly mouths, are often the least important ones if viewed from the standpoint of health impairment. The school age is, as we all know, a critical stage of human development; it covers the most important period of dentitional evolution and a time when the nervous organization is subject to a variety of stresses and irritations which may, and often do, produce effects of the most serious character. The physiological activities going on in both jaws in connection with the exchange of

the deciduous for the permanent dentures are in themselves sources of nervous stress, and when interferences occur which delay or obstruct the process an amount of peripheral irritation is set up which is the fruitful cause of many and serious reflex disturbances. Chorea, epilepsy, insanity, mental backwardness, all have their often unsuspected origin in impactions, infections, and malpositions of the teeth at the period under consideration. The results obtained at the psychological clinic of the University of Pennsylvania, the studies of Dr. H. L. Upson of Cleveland, and the work of many other observers, leave no room for doubt as to the dental origin of many cases of the difficulties named, and compel a recognition of the importance of appropriate dental treatment for removal of the source of the trouble.

The recognition of these cases and their appropriate treatment demands, of course, expert skill, and involves the services of an inspector fully competent to make diagnoses in cases which are often of utmost obscurity. Nevertheless, it is just this class of cases that most require attention, and that not only on account of the present pathological lesions of the graver sort, but because from the mental backwardness which they involve, they are a financial burden to the state—a burden so great, by the way, that statistics clearly show that it would cost the state less to pay for the dental service necessary to correct their defects than it does to continue such children year after year in classes below their normal grades. Properly organized public school dental service must seek out these cases and correct them.

The mere curing of toothache, the correcting of irregularities of the dentures, and cleaning teeth are of relatively minor importance to the neuroses developed from defective dentition or to malnutritional disorders arising from mouth infection. A still further field of inquiry, and in many respects the most important question of all in relation to public school dental service, is the dietetic question. Scientific study of the etiology of the various disorders which affect the human denture point more and more to the conclusion that the majority of them have their remote causes in defective feeding —defective as to kind and amount of food, and defective as to its mouth preparation. Statistics of dental inspection of school children have thus far been mainly concerned with the number of defective teeth and the kinds of defects. These statistics are now sufficiently large to impress the fact that caries is practically universal and in practically the same degree. What we need now is to gather statistics that will throw some light upon the predisposing causes of caries, and among them we need to investigate the relation of food habit to the etiology of this universal disorder.

I have suggested these points, not only for consideration and discussion, but also to emphasize the fact that, if we are to take advantage of the great opportunity which this general demand for public dental service affords, we can only really do so by clearly recognizing that a larger educational preparation for the work is needed than that required for the performance of minor dental operations; and that if the dental profession will honestly measure up to the possibilities which the service affords, we shall not only by this means place ourselves squarely upon a professional plane with the medical profession, but acquire our rightful stature among the benefactors of humanity.

THE PHYSICO-PROSTHETIC CROWN AND BRIDGE, WITH REFERENCE TO FUNDAMENTALS.

By H. C. REGISTER, M.D., D.D.S., Philadelphia, Pa.

(Read before the Susquehanna Dental Association of Pennsylvania, at its annual meeting, Harvey's Lake, May 24, 1910.)

THE successful construction and maintenance of a prosthetic crown, or bridge carrying dummy crowns, has for its first consideration the foundation. This fundamental principle applies alike to all methods of crowning, and includes both the removable and the fixed bridge. My paper refers especially to the latter.

In civil or mechanical engineering, in the construction of a pier or abutment for supporting a bridge, the first consideration is the foundation upon which the superstructure is to be reared; and this support must not only possess several times more strength than that represented by the carrying capacity of the bridge, but must also meet the wear and tear of its use, both physically and mechanically.

While the foundations of both classes of bridging, the mechanico-civil and the physico-prosthetic, pursue the same object as to their fixation—*i. e.* as permanent a base as possible for the support and maintenance of the superstructure respectively—the physico-prosthetic bridge which I am about to describe differs in all other details of construction, as well as in its uses and in its foundational environment. While the first is fixed or changeless unless by accident, the environment of the other is ever changing through metabolic influences.

With the single exception of the staple-jacket partial crown carrying one or two esthetic dummies while retaining a vital pulp, I eschew the consideration of all forms of bases for crowns or bridge abutments other than the pulpless tooth-root. My reason for thinking it unwise to use vital teeth as bases to which to attach hollow crowns of any character, or as abutments for the retention of a bridge, is the morbid physical changes in the pulp tissues which usually follow such operations, and which many times transmit these pathologic influences to the gomphosis joint tissue, entailing much suffering to the patient and premature loss of the organ.

Dr. I. N. Broomell, in a paper entitled "The Adventitious Effect of Large Masses of Gold in Contact with Tooth Tissues"* says, referring to the gold-shell cap crowns cemented with zinc phosphate: "As a result of the microscopic study of a number of cases it is proposed to show that almost invariably the pulp tissue, and as well the enamel, dentin, and alveolo-dental membrane, are all more or less affected in various ways by such unnatural surroundings. Among the morbid effects produced are hyperemia of the pulp, dry gangrene of the pulp, calcification of the pulp tissue, sclerosis of the bloodvessels of the pulp, atrophy of the pulp, pulp nodules, secondary dentin, expansion of the dentinal tubules, with corresponding bulging of the dentinal fibers, pathologic pigmentation of the enamel and dentin, non-carious destruction of the enamel as well as destruction by caries, and perhaps a molecular change in this tissue. Any one of the foregoing may be the primary affection after which a train of pathologic conditions may ensue."

* See Cosmos for April 1910, vol lii, p. 389.

Clinical evidence, based upon the observation of pathologic changes manifesting themselves in and about the tooth crown and root, proclaims against such procedure in crowning or for bridging purposes as being untrustworthy and unscientific. Dr. Broomell's conclusions, based upon microscopic study, confirm my own judgment that it is always wise to remove the pulp from vital teeth when a decision is reached to apply a crown or bridge.

The period from middle life to old age —the time, with rare exceptions, calling for prosthetic restoration in the form of a crown or bridge—affords us, in normal conditions, perfect foundations in the physically completed development of the tooth-root. It is quite possible under such conditions for a pulpless root to retain its remaining life-energy through the connective tissue, cementum, alveolodental membrane, and alveolus—these allowing the root to continue normal because of the undisturbed vascularity and rich blood supply, and thereby to functionally meet all the wear and tear of a life-long service. To accomplish this, however, when a crown or bridge is used, it becomes necessary to consider what restored occlusion means for the health of the root. Again, we must avoid creating traumatic irritants in the form of badly adjusted ferrules; and furthermore, we must not lose sight of the bacteriological side of the subject, which manifests itself in the infection of devitalized teeth under ordinary conditions, and, in chronic cases, of gangrenous pulps of short and long standing.

The method I employ in the shaping of the crown or root to receive the prosthetic fixture of the type under description is confined to two classes of teeth: First, to the single-rooted teeth, which may include the bicuspids and which do not call for ferrules, and second, to the multi-rooted teeth or the molars, and at times to the bicuspids, which do have ferrules.

The fundamentals embodied in the root treatment are so closely allied with the technique of crown or root shaping for the reception of the fixture that they must be described more or less together. The crowns or remnants of crowns in the single-rooted teeth are amputated at the neck or cervix of the tooth with small burs, and the butt-end or base of the root is finished by following the anatomical curves in the bottom of the gingival space, so that the root and the artificial crown are brought, if possible, into juxtaposition at the cemental line. The protection given by the gingival fold to the crown base in a natural termination is also given to the root by its envelope of cement and dental membrane, thereby inhibiting the possibility of traumatism from the fixture, or recurrence of caries at this point. This procedure of quickly removing all excess of tooth-crown gives a direct approach to the pulp-canal and assists at the same time in preparing the root-base for the reception of the fixture. The most humane method of devitalizing the pulp is that of pressure anesthesia. I cannot recall a failure when entrance into the pulp has been obtained. Such an entrance can usually be had with a sharp No. 1 or 2 round bur, gently manipulated so that direct pressure on the tooth-pulp can be maintained for a few seconds. The pulp is then quickly paralyzed by the cocain and pressure method and stasis is effected. While it is in a state of collapse and inability to transmit pain, its removal and the reaming-out of the canal to at least one-half to two-thirds of its axial length can be done quickly, painlessly, and perfectly by the use of the bur, the broach, and the atomizer. The reaming-out of the inner layer of the dentin along the canal exposes the tubuli in the dentin for further treatment. About 33 per cent. of animal matter is left in the dentin after the pulp is removed, the decomposition of which produces toxins—this must be anticipated in a new case and corrected in old ones. In freshly removed pulps, the break is made along the odontoblastic layer, and we have the pulp prolongations—that is, the fibrils—filling the tubuli. Both fibrils and tubuli are in the dentin, and form part of its basic substance. The animal matter composing the fibrils in the dentin represents about

one-third of the dentinal tissue. It is easily taken care of by being sterilized and tanned before decomposition sets in or germ infection becomes a fixed condition. When a dowel is to be used, I endeavor to open up all canals to the size required for its reception. This gives not only a good approach to the canal, but also clears it of pulp tissue. Never hesitate to make a roomy approach in all cases of pulp removal.

While removing the pulp by instrumentation, much assistance is obtained by the use of warm water and alcohol, employing an atomizer with a small metal nozzle, and by flushing the entrance into the canal under an air-pressure of from 30 to 40 lb. The air-pressure alone, or under atomization, will often of its own action lift a pulp out, especially when the tissues are weak or broken along the odontoblastic layer. After the pulp is removed, the root is dehydrated with hot air until the effect is felt by the patient, and while the dentin is in a sponge-like or porous condition with dried fibrils, a germicide having a mummifying action is used to take care of the residual animal matter. The germicide is flooded well into the canal and allowed to soak into the dentin. This flooding will take care of all the animal matter remaining in the dentin, and thus inhibit any possible change taking place in the way of decomposition or infection, the dehydration of the dentin permitting this to be accomplished if the proper germicides be employed.

In gangrenous conditions after the crown is removed, the treatment differs slightly. The atomizer is used first at a pressure of not above 15 to 25 lb., for removing any loose decomposed matter, before an instrument goes into the canal. This procedure anticipates possible infection of the apical region. The solution used is warm water alone or with alcohol, or a weak solution of hydrogen dioxid, potassium permanganate, or any detergent mixture. The aim is first to clean out the loose contents of the cavity and pulp-canal by a sluicing process; the medication of the root follows. The use of the atomizer is followed by that of compressed air, preferably warm, at the pressure previously mentioned. The air-current dries up any loose débris and lifts it out of the cavity, and at the same time dehydrates the basic substance of the dentin. While in this condition the germicide is flooded into the canal and is allowed to remain for two or three minutes.

This dehydration of the dentin is an essential factor in enabling the germicide used to attack the germ growth. Two liquids cannot occupy the same space at the same time, so, to reach and destroy germs in the tooth body the liquid which naturally saturates the dentin and gives sustenance to bacterial growth, must be removed. The germs still remaining, in a dried condition, in the air-spaces made by dehydration are annihilated by the germicidal action, inasmuch as contact is absolutely obtained. Therefore, in all gangrenous conditions, flood the canal with the liquid germicide after dehydration but before instrumentation; the germicidal treatment is followed by the operative procedure. The germicide, the formula of which I will give you later, is flooded into the canal, and with a small canal instrument is gently pumped into the apical region of the root. Dehydration is repeated and the canal is reamed out with a bur, for the reasons previously stated. In chronic gangrenous conditions, dehydration may be repeated, if thought necessary, at two or three sittings. The canals are each time flooded with the germicide and allowed to remain so for several minutes; after that time I consider the case to be immune to further germ infection. Pathologic changes cease in and about the apical area; indeed, lame roots almost immediately become normal. I lay much stress, for the maintenance of normal conditions of the root tissue and for the longevity of the crown or bridge, upon absolute sterility of devitalized dentin, and this can be procured only by internal treatment of the dentin through the canal before it becomes hermetically sealed.

When used as directed, my formula gives a germicide usable in all classes

of pulpless roots. It anticipates infection and produces sterility when infection is already established. From clinical observations covering a hundred and more cases, I have yet to record a single failure. Therefore, in giving you the formula, I feel from my own experience that you are going to avoid much anxiety and suffering that is generally associated with the treatment of these cases of possible infection. The formula is as follows:

℞—Iodoform,		
Zinc oxid,	āā	ʒss
Formaldehyd,		♏x
Sodii benzoate,		gr. iv
Oil cassia,		ʒivss. M.

Triturate the iodoform and zinc oxid on an ointment slab intimately, gradually incorporating the oil of cassia into this. Dissolve the sodium benzoate in the formaldehyd and mix it thoroughly with the foregoing mixture.

This gives a smooth ointment of butter color and with the odor of cinnamon, a pungent taste, and slightly soluble in saliva.

A second preparation is made from this in a liquid form. About two drams or a coffeespoonful of the germicidal ointment is added to a solution of two fluidrams each of chloroform and of alcohol. The quantity is, however, immaterial, provided a saturated solution is made. This fluid preparation is that used for saturating dehydrated dentin. I believe that through soakage and through exosmotic action the germicide passes from the pulp-canal to the cementum, and sterility is assured.

For the treatment of pulpless teeth, whether in cases of recent pulp removal or of gangrenous conditions, where this treatment is followed by filling restorations, the methods described in this paper hold good. For closing the canal after completing the treatment, a small pellet of the ointment is packed into the canal, and a gutta-percha cone dipped into chloroform is pressed into the ointment in the canal and thoroughly packed, or a small amount of the germicidal ointment may be incorporated in a mix of zinc phosphate and the canal filled with the mix. These two methods cover all that can be desired for a permanent root filling and will also be of avail in a good-sized perforation of the root-wall. Care should always be taken that the ointment fills the perforated space. In my practice I mostly use Standard alloy washed in alcohol for filling pulp-canals. In very recent or accidental exposures of the pulp, if attended to before the circulation becomes abnormal through toxic impressions, a return to health may be obtained through this treatment. The germicide in these cases is flooded into the cavity, and the cavity and exposed pulp is saturated for several minutes. After this the exposed pulp may be covered with the ointment and a thin mix of zinc phosphate flowed over it. Where there is any disposition to irritation or lameness of a pulpless tooth-root, the following diffusible stimulant, used carefully, will be found reliable:

℞—Tinct. iodin,		ʒss
Tinct. aconite,		
Chloroform,	āā	fl3j
Glycerin,	q. s.	ʒj
Peppermint,		gtt. v. M.

Apply this with a camel-hair brush to the gums every two or three hours. This formula I also find very beneficial in pyorrhea, and it may be used by the patient.

To procure sterility in the body of a tooth or around its roots, the germicide must come in contact with the germ-growth and inhibit such pus-producing germs as streptococci and staphylococci and other pus-producing bacilli, and yet not destroy the new cell life of formative tissue in and around the root socket. Through dehydration of the dentin, the positive results of the germicide are obtained within the tooth-root. When used in pyorrhea sinuses or in fistulous tracts about the roots of teeth, pus disappears, therefore it must destroy the pus-producing germs that destroy the leucocytes. The local irritants created by calcic granulations should be removed by instrumentation followed by the use of the germicide. The germicide is applied

by a syringe or dropper, and allowed to saturate the pockets and to remain one or two minutes before washing out. It is quite pungent at first contact, but soon leaves a pleasant after-taste. In pulpless teeth, infection arising from within must be met in the internal portion of the root, and the basic substance of the cementum and dentin rendered sterile. The cementum of a tooth-root is not physically or functionally disturbed in its life and energy by removal of the pulp. Its association with the pericementum and alveolus will continue to maintain normal relations with the alveolus if no bacterial infection arises from the internal parts of the root, especially at or near the apex. Again, no mechanical device, such as a ferrule or hollow crown, should be allowed to impinge upon the cemental or pericemental tissues on the outside of the root, thereby causing traumatism of these attachments of the root and alveolus, inviting pathologic changes and recessions. A tooth-root can remain normal for years without a pulp, but not for a day without its cemental tissue.

When these possible pathologic conditions are anticipated or corrected and the occlusion is perfected by normally shaped tooth-cusps and tooth-contours, the prosthetic fixture becomes so perfectly blended into the physical life of the parts treated that function, articulate speech, and expression are completely restored.

The method of forming the root attachment of a crown or bridge for all single-rooted teeth, and embracing at times the bicuspids, consists, after the root base is prepared as previously stated, in adapting a whole or partial disk, made of 32-gage pure gold plate to the base or butt-end of the root, terminating it at the root-edge. The dowel passes through the disk to as far as two-thirds or thereabouts of the vertical length of the canal. After perfect adjustment the dowel is soldered into the disk. The dowels are made of three sizes of iridio-platinum square wire, gage Nos. 16, 17, and 18, to correspond with the root size and strength respectively. The largest size is always used for the canines, and for the centrals when possible, otherwise the second size for the centrals and the laterals; the third size for the laterals. The bicuspids should carry dowels as large as the root will take.

The object is to use as large a dowel for each single root as is possible. The dowel should go well up into the canal, without danger of cutting too near the cementum—from one-half to two-thirds of the canal length is a good rule. It is most desirable to get all the strength possible in the dowel placed in the long axis of the root. This long bearing of the largest size wire that the root will take, associated with the oval-shaped disk, makes an ideal base, anticipates the possibility of root fracture, and admits of the most artistic results being accomplished. After the dowel and disk are united, the latter is burnished and malleted into absolute contact with the root base. This is preferably done by the mechanical mallet, used on the engine, or by the electric mallet. The edge of the disk is made the same diameter in all its bearings as the root base, and conforms to it exactly. This forms the base upon which the crown is built. It also forms the attachment of the crown to the single-root tooth, or one of the anchorages or an abutment of the bridge.

There are several methods of attachment. One is by the use of zinc phosphate alone, which is allowed to crystallize. This method is usually practiced. Another is the zinc phosphate and alloy combination, which may be used in two ways: Either they are first mixed separately and then united by spatulation into a paste of the consistence of very soft putty, and the canals and dowels are filled in and around with this paste, or the zinc phosphate cement is used alone and the crown or bridge then pressed into position. In either of the last two methods the alloy, mixed as usual for fillings, is packed by hand and with the mallet into the cement and around the dowel with small canal fillers. When these latter methods are pursued, it is necessary to cut off the front of the disk to the line of the dowel attachment. This

exposes all the labial or front part of the root base and canal in and around the dowel. This accessibility permits the canal-fillers to carry the alloy in the usual form for filling purposes into the canal, and the fixation of the dowel and root are made absolutely permanent. Unless strictly protected, large masses of zinc phosphate absorb organic matter and become filled with bacterial growth and decomposing matter, while a high-grade alloy is fixed, protective, and hygienic. I maintain that the fixation of a crown or an abutment for a bridge should be made as permanent as the physical conditions will permit. The method should effectually provide for permanent use and anticipate all possible contingencies, and that both as to hygiene and as to breakage of the faces. While a removable bridge with telescoping attachments can be constructed along these lines, there can be no claim made of its being more hygienic or cleaner than the fixed bridge of this type.

The method employed for abutments for the molar classes of cases is much the same as in preparing a molar for a gold cap crown. From one-half to two-thirds of the crown should be allowed to remain, and the external form be modified into a true cone-shape, with the base at the neck sufficiently large to prevent the band or ferrule from impinging upon the cementum. It should be so adapted at this point as to form a perfect contact around the tooth at its neck without impinging on the root connective tissue. The width of the band forming the ferrule should be about a sixteenth of an inch wider than the bite calls for. After the band is united and adjusted to a perfect fit at the base of the crown, this excess of width on the occlusal surface is turned in with shaping pliers to meet the proper occlusion. On to the inner part of the rim thus made is flowed a strong addition of gold solder. This completes the gold abutment or crown *per se*. In form it is simply a ferrule or ring with the occlusal edge turned in. The occlusal or biting surface is left open to allow for the attachment to be made to the natural root, and this is done with alloy and zinc phosphate fillings and dowel attachment. The roots of the molars are treated as described for the single-rooted teeth. One canal at least, preferably the palatal root in the upper arch and the distal root in the lower arch—since they are more accessible and meet all requirements—holds the dowel, which is built into the root and gold crown with zinc phosphate and alloy at the time of the adjustment of the fixture. Platinum gold plate of 30 gage—that is, gold and platinum rolled together, forming a surface of gold on one side and platinum on the other—is used in making all hollow crowns where alloy is used as a filling and retaining device. The alloy used in the body of the crowns comes in contact with the platinum, and both metals remain fixed and unchanged both during and after crystallization of the alloy. The zinc phosphate incorporated into alloy while soft is absolutely protected by the latter after its crystallization.

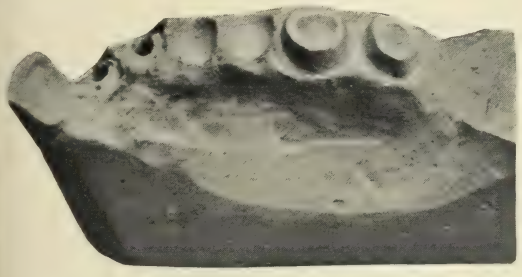
To protect the gold from being stained by the mercury contained in the alloy during the process of fixation of the bridge or crown to the abutment roots, it is only necessary to cover the gold surface with sandarac varnish, which is allowed to dry. This is accomplished in a few moments with a pellet of cotton held in the pliers.

It is most desirable that all porcelain faces forming part of the prosthetic crown or bridge be interchangeable. This kind of crown permits the most artistic results to be effected, while it also anticipates trouble in case of accident by an easy and perfect replacement of the faces. It is a consideration of much moment that it allows the gold base to be completed in part or whole without danger of the porcelain faces being checked or cracked during construction of the gold truss. In this type of bridge the truss is made up of a series of arches formed by the dummy and abutment crowns. The necks of the dummy crowns all impinge into the gum tissue.

Ten years ago I was working up this system and invented a detachable porcelain face that I had the honor of demon-

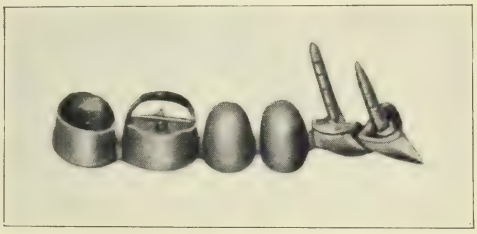
strating before the Pennsylvania State Dental Society at Neversink Mountain, Reading, Pa. The same principle and forms are now embodied in the Steele and Evslin tooth-crown. I endeavored at that time to have these faces made by the dental depots, but failed to get anyone interested. These teeth can now be had in good forms and a variety of shades. Personally, all I desire is to participate in the use of this most desirable crown.

Fig. 1.



Showing preparation of abutments and gum contacts for dummies.

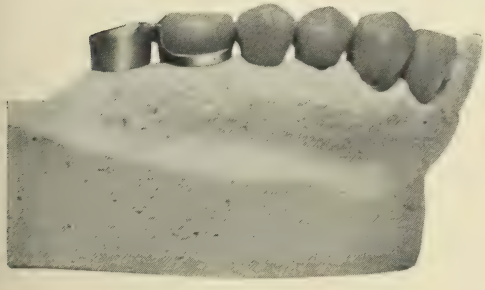
Fig. 2.



Showing the assembled and completed bridge. Note convexity of dummy gum contact surfaces.

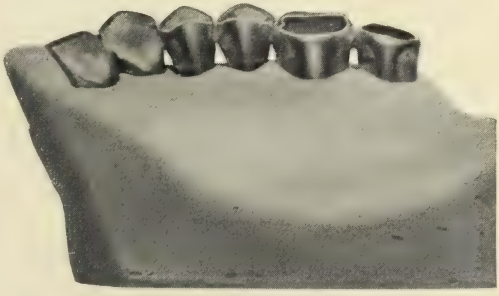
gual surfaces with gold, and the interproximal spaces are reproduced. The dummy crown at the gum contact is made convex, just the opposite of a saddle, and impinges into the gum to make a cup all around the dummy. This is especially true of the upper arch, the dummy creating thereby an artificial gingiva. On the inferior ridge it is less pronounced, unless the mandible is very flat.

Fig. 3.



Showing buccal view of completed bridge on model. Note the gingival festoons of the bicuspids.

Fig. 4.



Showing lingual view of completed bridge on model.

The dummy crowns, when completed, are unique, differing from any heretofore made. They make the bridge stand, as it were, on a series of what may be called pilings. Each dummy tooth is contoured to normal shape on its palatal and lin-

In preparing the dummy crown the mouth should be examined to determine how much pressure the individual ridge will stand. On the model, a depression is cut out with a bur, anywhere from a sixteenth to an eighth of an inch deep,

tapering from the center, this being the deepest part, to the edge, and at the same time following the contour of the ridge surface. Pure gold of No. 32 gage is burnished into the cups, forming a depressed disk. The disk is made as small as desired to form the neck contact at the gum line of the individual dummy crown, and the depression in the disk filled with solder; this is done to give strength to the base receiving the dummy face. The disk can be made complete by casting. The backing and removable dummy face crown are adjusted upon the disk to meet the occlusion. The same course is also pursued in adjusting the crowns to all the single-rooted teeth. The latter are given a perfect contour finish on their palatal or lingual surface with gold solder, thus uniting the disk and backing.

The palatal or lingual contour shaping is given to the bicuspids by a half-band, bent into contour shape, which forms a half-barrel constricted at the gum line, and soldered to the disk and backing. The backing is to receive the porcelain faces, and the space formed by the half-barrel is filled in with gold solder and given a perfect occlusion.

In the molar class of dummy formation, when not over-large, the construction is the same. When extra large, a hollow gold crown is completely articulated on the model, and after the crowns are assembled in the completed bridge, the space in the gold crown is filled in with rubber and vulcanized into cone shape, to meet the gum line. This is done for the purpose of overcoming weight. The abutment crowns and the dummy crowns to form the bridge are first assembled in twos or threes. The uniting of the crowns in sections is done for the purpose of anticipating any shrinkage that might take place in the process of soldering a large piece all together. They are formed to meet at the interproximal contact and are united by solder to two-thirds their length, thus leaving one-third open in an inverted V-shaped space, which represents the interproximal gingival sectional space. On each side of the space is the natural gingiva of a root, or an artificial gingiva made by the dummy crown pressing into the gum seat. This mechanico-anatomical arrangement accomplishes two things: It anticipates the lodging of food, thereby insuring hygienic conditions, and the gum contact with the dummy causes a sense of touch very much akin to that which is transmitted from the natural roots of the teeth.

This is a great gain, for in functioning the user feels how the masticating muscles are working, and there is an inherent confidence that an overstrain on the bridge will never be made. The cone shape given the dummies at the gum contact produces no irritation. The effect of the slight pressure made at the time the bridge is fixed to place is soon relieved by the soft tissues shaping themselves around the dummy crowns.

At the time the crowns are being assembled and soldered together to form the truss, an addition for strength is made by a rim of gold plate extending from the occlusal edge of the molars or bicuspids to half the length of the crown on the palatal or lingual surface. This half-hoop, which stands at a right angle with the occlusal surface of the crowns, meets at the middle line on the palatal side of the crown, dips into the approximal spaces, and is soldered to place. It thus becomes a part of the truss. After being properly shaped, it also gives a contour shaping to the palatal and lingual surfaces of the crown.

So with incisors and canines. The additional strengthening gold band is made to fall against the backing and be incorporated in the gold contour of the palatal surface in this class of teeth.

When it is desired to have a porcelain face on a molar crown, it is accomplished by first filling the completed ferrule or gold crown with calcined plaster. The buccal wall of the crown is cut out to the width of the backing required, and the backing set in far enough to receive the porcelain face, leaving a band of gold on the crown at the neck sufficiently wide to embrace the root.

This type of bridge can be made by the casting process. When this method is used, it is best to make the disk base of

pure gold plate. The disk and backing are soldered together and the contoured models are made in wax. The crowns are built in pairs, if desired, and afterward all the crowns are united to form the bridge truss by the additional hooping for strength along the palato-occlusal border-line. I do not think, however, that there is any advantage in the casting process over construction by the pattern system. Indeed, I much prefer the latter method, for the reason that the architectural plans are more correctly carried out. I also believe that a more delicate and beautiful structure can be built in this way and the strength of the truss and porcelain faces be maintained.

The fundamental facts displaying the principles involved in asepsis and antisepsis, and that play such a prominent part in the prevention and cure of both local and general disease, apply with the same force to the bacterial activity found in the oral cavity as in other parts of the body. The dentist's best efforts are directed against bacterial activity manifesting itself in the destruction of the teeth themselves or in bacterial toxins associated with traumatism in and about the gomphosis joint. Therefore, if we would have no recurrence of caries or crippled teeth, with abscessed roots or fistulous tracts, we should direct our efforts along the lines of asepsis and antisepsis in rendering sterile a pulpless root-canal as well as in the restoration of a tooth cavity. Upon continued sterility of the tissue treated depends success or failure. It must be realized that diseased teeth must be treated as such—treated from the standpoint of the surgeon or physician, not "fixed" by the mechanic.

If the stomatologist is to receive a high appreciation of his efforts in crown and bridge prosthesis, he must aim to make it the means to the end rather than the end itself. What his work does for or gives to the user in functioning power should be the first consideration—*i.e.* the service rather than the fixture. Essentially, this is what is principally sought for, and the construction of the fixture employed must be such as to bring about such a consummation.

The general surgeon, the orthopedic surgeon, the ophthalmologist, all employ extended mechanical means in treatment. Many of these appliances are used through life, and with good results. So the stomatologist, if he looks for perfect success, will realize these truths. He will be broad enough to harmonize the formative vital forces from within with the causes of disease from without.

TREATMENT OF FRACTURES OF THE MAXILLÆ.

By J. M. MURPHY, D.D.S., Temple, Texas.

(Read before the National Dental Association, Southern Branch, at Houston, Texas, May 4, 1910.)

IN the treatment of fractures of the maxillæ, the ingenuity and resources of the operator are taxed to a greater extent than in almost any class of cases that occur in ordinary practice. The reason lies not in a lack of precedent set by the use of some particular method or appliance, nor in the lack of literature on the subject. Jaws have been broken and treated from time immemorial, and sundry appliances and methods have been used and advocated; but the operator's ingenuity is taxed in meeting and making provisions for the

complications that are met with, and in constructing an effective appliance to suit a case with particular complications. The treatment of a simple fracture of the lower jaw, when all the teeth are good and in normal occlusion and a healthy mucous membrane of the mouth exists, is a very simple matter, as will be shown later. Such simple cases, however, are exceptions and of very rare occurrence.

COMPLICATIONS IN MAXILLARY FRACTURES.

Some of the complications that are met with and have to be provided for are loss of teeth, natural malocclusion—by that term is meant a malocclusion that existed before the accident—pathological conditions of the mucous membrane of the mouth, compound and multiple fractures, and other traumatic conditions that result from an injury, all of which must be considered.

PRELIMINARY TREATMENT OF FRACTURES.

It is also seldom that the operator has the opportunity of seeing the case immediately after the occurrence of the accident, which of course would be the logical time to begin treatment. The fracture has usually been dressed temporarily, and more or less time has been allowed to elapse. When such has been the case, it is best not to use haste in reducing the fracture and placing appliances, as in so doing too great a risk of introducing infection is encountered. It is best to wait until the acute swelling subsides, as the loss of a few days or a week will do no harm. As a preliminary treatment, irrigation of the mouth and nose is applied with a 1 per cent. sterile solution of carbolic acid, used as hot as can be borne and introduced from a common fountain syringe, elevated to such a height as to give a stream of considerable force, this to be repeated every hour or so according to the severity and demands of the case. This treatment should be kept up constantly from the time of the accident until all retaining appliances are discarded. The retention and decomposition of secretions and particles of foodstuff in the interdental spaces and the buccal cavity should be diligently guarded against, and the above is the best means that I have ever found with which to accomplish this.

LOCATION AND CLASSIFICATION OF FRACTURES.

As for the classes of fractures, as viewed from a surgical standpoint, which one encounters in this kind of practice, you are referred to any standard work on fractures, where a more general treatment on the subject can be had. In my experience, fractures of the jaw are seldom simple, but usually compound and multiple. I have had more cases of fracture of the lower jaw that occurred on the left side than on the right. I am not prepared, however, to say that the left side is more susceptible to injury than the right. I can see no reason why it should be, but that has been my experience. I have never had a case of fracture on the right side where none existed on the left, while I have treated a number of fractures on the left where none existed on the right. The lower jaw, of course, is more susceptible than the upper, the reasons being very apparent. If I were called upon to say where fractures occur most frequently, I would say that according to my experience they occur most frequently between the symphysis and cuspid; second in frequency is the portion between the cuspid and first molar; third, the region of the third molar or the junction of the body and the ramus of the lower jaw, and fourth, the upper jaw. Hence, for the sake of convenience, I shall divide fractures into these four classes, and shall treat them as such in the matter of selecting retention appliances.

MEANS OF REDUCTION AND RETENTION.

We will now consider the matter of reduction and retention. I suppose the most ancient, as well as the crudest and most ineffective form of retention, is the

bandage. The next method in regard to antiquity is probably that of wiring the teeth together. Angle says that this was practiced by Hippocrates in the fifth century B. C. Both these methods, while antiquated and crude, nevertheless, in some cases and under some conditions, can be well used in conjunction with other appliances. The vulcanite interdental splint was one of the first contrivances that the modern dentist contributed for the relief of this class of sufferers. In Scudder on "The Treatment of Fractures" a number of styles and modifications of the interdental splint can be found. This is a mode of retention that I have never found it necessary to use. I have seen cases treated by that method, however, and have noted how difficult it is to maintain any degree of asepsis, so that I am possibly somewhat prejudiced against its use. There is a form of sub-mental splint which consists of a metal or vulcanite splint to fit the occlusal surfaces of the teeth, and fastened to a metal cap that fits the chin and jaw underneath by means of bars and nuts; this in many instances could be used to advantage. The most important step that has been taken toward the application of scientific principles in the retention of this class of fractures was taken by Dr. Edward H. Angle, who devised a system of adjustable bands, which may be adjusted to and fastened on any tooth by means of a threaded bar and nut; this band also has soldered on the same side a ball to which wire ligatures may be easily attached, and in the treatment of many cases of multiple fracture these little bands are invaluable.

LUKINS' RETENTION APPLIANCE.

The appliance that has been of greatest value to me in this work has been the band devised by Dr. C. D. Lukins, which is similar to that of Dr. Angle in its application, its principal difference being that of the threaded bar, which in the former is hollow, through which the ordinary orthodontia expansion arch bar, traction bar, and jackscrews may be passed. These bands, in conjunction with the appliances ordinarily used in orthodontia, make the most effective and compact appliance for the retention of these fractures. Their first and most salient feature is the rigidity and stability with which they hold the parts in position; second, the compactness and simplicity of the appliance, which makes it possible to maintain the greatest amount of asepsis.

PRINCIPLES FOR SELECTING AN APPLIANCE.

As I stated in the beginning, all of one's ingenuity is often taxed in devising an appliance that will most nearly eliminate all objectionable features and that can cope with the complications that are found in each particular case. Two features should ever be kept in mind in making this selection; first, the maintenance of absolute rigidity of the ends of the fracture, and second, the compactness of the appliance, this latter being very important, on account of it being easier to keep it perfectly clean.

TREATMENT OF FRACTURE BETWEEN CENTRAL AND LATERAL.

To illustrate the application of our appliances, we will take an hypothetical case of our above-mentioned first class, a compound fracture between the central and lateral, with a normal set of teeth in normal condition. I should select two Lukins clamp bands for the second bicuspid on either side, place them in position and tighten them thoroughly, and with an ordinary expansion arch bar placed through the tubes on the buccal sides, and the nuts on the distal side of the tubes, the fracture could be reduced completely by gradually tightening the nuts on the arch bar, after which with wire ligatures I would lace each tooth between the bands firmly to the bar. I should rely solely on this appliance and frequent irrigations, and expect no trouble or complications.

TREATMENT OF FRACTURE BETWEEN SECOND BICUSPID AND FIRST MOLAR.

In our second class, for a fracture between the first molar and second bicuspid, I should select a Lukins clamp band for the second molar and first bicuspid, through the tubes of which I would place a traction bar, with the nut in front of the bicuspid, tighten as much as necessary, and ligate the intervening teeth to the bar. In this case I would want the assistance of the old-style bandage, to prevent as much movement of the jaw as possible.

TREATMENT OF FRACTURE IN THE ANGLE OF THE JAW.

In the third case, in a fracture in the angle of the jaw, I would use Angle's fracture bands on two teeth in both the upper and lower jaws on the side of the fracture, and on one upper and one lower tooth on the opposite side, close the teeth normally, lace the lower teeth firmly to the upper ones, and keep them in this position. This, however, is a very dangerous method, on account of the possibility of strangulation in the case of vomiting, coughing, etc.; this should be guarded against as much as possible. In the place of the Angle bands, I have in two cases used with splendid results a strong wire ligature twisted around the necks of the teeth. This serves very well as a substitute, but the wires will stretch and allow some misplacement of the ends. The method of closing the jaws firmly will be found necessary also in some cases where a loss of a great amount of bone has occurred, as in the cases I and II in the report which will follow. This method, in connection with the Lukins bands and arch bar, should give ideal results.

TREATMENT OF FRACTURE OF THE MAXILLA.

The treatment of a case of class four will depend entirely on the extent of the fracture, which will be illustrated in the report of case VIII, which was very simple, and in that of case IX, which was very complex and difficult. In the majority of fractures of the maxilla, more or less suppuration is to be expected, as a result of small spiculæ of bone that remain in the fracture and act as an irritant; these may be gradually washed out and removed as they work to the surface. In the treatment of a fracture of this kind, one need not be alarmed to find in the vicinity of the fracture a fistula and a considerable amount of pus flowing therefrom. The operator may know that a spicula of bone is present, which with a probe and excavator can usually be located and easily removed. In view of this fact, together with the rapid decomposition of the oral secretions and the difficulty of removing débris that collects around the teeth in this condition, I wish to emphasize the importance of frequent and thorough irrigation of the mouth. By applying the solution as hot as can be borne by the patient, the tissues are relaxed, free circulation is established, and the process of granulation is facilitated.

REPORT OF PRACTICAL CASES.

As a matter of illustration, I will now give a report of a few practical cases.

Case I. The patient, a man of about forty-five years of age, received a blow on the lower jaw, resulting in a compound fracture between the left cuspid and lateral. This case was seen on about the tenth day. Suppuration was very profuse, and considerable loss of bone tissue was noted, causing a marked malocclusion when the ends of the bones were placed in proximity and the occlusion was placed at normal, leaving quite a space between the ends to be filled in with new bony tissue. This case was treated by wire ligatures placed around the necks of one molar and two bicuspids above and below on each side; then the teeth were placed in normal occlusion, and the wires that were around each opposing tooth were twisted together very tightly. This was supplemented with bandages, etc. The mouth was frequently washed with a one per cent. sterile solution of carbolic acid, and in about four or five days the suppuration was arrested, and a complete union was established in about five weeks, with good occlusion.

Case II. This case was also one of a man of about forty-five years of age. The fracture had occurred between the lower left central and lateral, the lateral being lost completely. This case was first seen on the twenty-fifth day after the accident, during all of which time there had been the most profuse formation of pus, which had destroyed enough bone tissue so that the canine and the central would touch, apparently in a normal position, when the ends were left at rest. This case was treated by thoroughly curetting the ends of the bone, and the teeth were placed in normal occlusion, and ligated with the same wire ligatures as in the case just described, which when tightened left a space of approximately one-quarter of an inch to be filled in with new bone. The teeth were kept ligated for about eight weeks, when the ligatures were removed, and a temporary bridge was placed on the left cuspid and bicuspid on one side of the fracture, and on the right left central, lateral, and cuspid on the other, which remained for some months. This was removed, and a sound, healthy union obtained, with practically normal occlusion.

Case III. This case was that of a young man of about twenty-one, with a compound fracture between the left cuspid and lateral. I saw the case first on the eighth day after the accident, when suppuration was very profuse. I used Lukins' clamp bands and arch bar, the bands being placed on the second bicuspids with all intervening teeth laced firmly to the bar. The case was kept thoroughly irrigated by the nurse at the hospital and required little of my attention after the first adjustment. The patient was dismissed in about four weeks. Occlusion on the right side was slightly open at that time, but was restored to normal in about two months.

Case IV. The patient, a man of about thirty, had suffered a fracture in the same position as the one preceding. The case was seen about ten hours after the accident. An appliance was placed as in the preceding case. No infection occurred, and there was little swelling. The patient was dismissed in three weeks with ideal results.

Case V. The patient, a man of about forty-five, presented a compound fracture between the lower left cuspid and bicuspid, also between the left first molar and bicuspid, and between the body and ramus of the jaw. This was complicated with the concussion of the brain and other general traumatic conditions, all of which kept his life in a very uncertain balance for some time. The fracture was treated with Lukins' clamp bands on the second molar and cuspid, the latter being supplemented with bands on the central and lateral for support. These two fractures were drawn together by a traction bar placed through the tubes of these bands, with a nut in front of the cuspid tube, and tightened; the intervening segment and teeth were ligated firmly to the bar. Angle's fracture bands were placed on two teeth in the upper jaw, also one on one upper and one lower tooth on the right side. The teeth were then placed in normal occlusion and ligated firmly, which brought the distal fracture into good position. The distal fracture was the first of the three to unite. The case was discharged in about seven weeks, with good occlusion.

Case VI. This case was one of a man, twenty-five years of age, with a compound fracture between the lower left first molar and bicuspid, and an oblique fracture between the body and ramus. This case was treated essentially in the same way as case V, with Lukins' clamp bands and traction bar with Angle's fracture bands on the upper teeth, the teeth being held in normal occlusion with wire ligatures as in case V. The suppuration was very profuse for about ten days. The case was dismissed in about seven weeks with good occlusion. The fracture in the angle of the jaw was the first to heal.

Case VII. The patient was a child of about fourteen, with a compound fracture between the lower left cuspid and bicuspid. The teeth were not at all close. I made loosely fitting German silver bands for the two bicuspids, the cuspid, and lateral, placed them in position, took an impression with modeling compound, removed the bands with the impression, poured a model, soldered the bands firmly together, and stiffened them thoroughly with a metal bar soldered to each band across the lingual side. I cemented this appliance in position, and had no further trouble with the case. I mention this case in order to show that the practitioner will meet cases in which he will have to devise a method of his own.

Case VIII. The patient was a man, sixty years of age, with a fracture of the maxilla, or, more correctly speaking, the alveolar process, including the six anterior teeth and the right bicuspid, had broken loose from the maxillaries. This case was treated by means of Lukins' clamp bands on the molars, with the expansion arch placed in position, with the

nuts anterior to the bands, and the anterior teeth ligated to that, supplemented with a bandage to prevent any attempt on the part of the patient to use the jaws. In about three weeks the appliance was removed, and the patient has good teeth today.

Case IX. The patient, a man of about thirty-five, was kicked by a horse, the toe of the shoe striking just under the nose, breaking both maxillaries and severing both palatal bones from all bony attachments. There was also a compound fracture through the median line which completely separated the bones. The injury to the soft tissue was severe, and hemorrhage very profuse. I first reduced the median fracture with Lukins' clamp bands on the molars with an expansion arch, placing the nuts on the distal side of the bands, which, when tightened, reduced the median fracture beautifully. The teeth were then in the mouth like a loosely fitting plate. This fracture was reduced by means of a swaged aluminum plate, which fitted loosely over the teeth with a small roll of modeling compound placed in the rim to prevent any movement or slipping of the teeth. This was placed in position and held there by means of an Angle headgear and retracting bar. By irrigation of the nose, mouth, and throat with a two per cent. sterile solution of carbolic acid every hour, I was able to prevent any infection and to secure beautiful results, although at the outset the prospects for a successful termination were anything but promising.

SURGICAL OPERATION OF THE FRENUM LABII SUPERIORIS.

By T. G. BRADFORD, D.D.S., D.M.D., Dallas, Texas.

(Read before the National Dental Association, Southern Branch, at Houston, Texas, May 4, 1910.)

THE subject selected is of special interest to the dentist who has ever undertaken such a case. The attachment of the muscle of the frenum labii superioris is from the upper lip to the gum tissue, just above and between the central incisors; its position is at the median line, and its removal surgically is indicated when its attachments are very low, and when its peripheral fibers extend between the central incisors and attach to the gum tissue on the anterior palatal portion of the mouth just back and between the linguo-gingival ridge or cingulum of the central incisors. This attachment causes the separation of the central incisors, resulting in the malocclusion of the teeth and also in an impediment of speech by the escape of air between the teeth.

"Nature never corrects a deformity unaided," and if such a deformity is inherited, it is intensified. In pathological and physiological conditions, if a cure is to be effected the cause must be removed. It is an easy matter to draw the central incisors together, but it is very difficult to make them stay. Retaining appliances may remain on these teeth from one to two years and longer, but when they are removed the teeth will assume their former abnormal position, because the constant moving of the lip moves the muscle, which extends between the teeth.

MODUS OPERANDI.

Bands of German silver, which is superior to any other metal for this work on account of its durability, strength, and lightness, are made for each central incisor, and spurs are soldered to the mesio-labial surface of each band at the right edge of the teeth; if this is not done, and brass ligatures are applied to draw the teeth together, one of the teeth will elongate and be in supra-occlusion. If these spurs were soldered to the cen-

ter of each band or to the distal surface, if pressure were applied, there would be a rotation of the tooth in its socket, and an additional malocclusion would be established in trying to correct the first. When these bands are ready for cementation, they are placed in boiling H_2SO_4, and then in water, removed, and thoroughly dried. Cotton is placed under the lip and the teeth are dried by the use of alcohol and hot air. The cement is mixed very thinly, and well spatulated to the consistence of thick cream, and then with a spatula the cement is placed in the bands and these are pressed home, using a band-driver to assist in a more perfect adaptation of the bands. Then the bands are burnished well, so that they may fit accurately, which will also prevent an accumulation of food. The appliance is dried thoroughly with hot air, and all excess of cement is removed to prevent any further irritation of the tissue by the cement. The patient is dismissed till the next day, when the cement will have set sufficiently, so that pressure will not loosen the bands.

The operator is then ready for the surgical part of the work; it is needless to even mention asepsis to a body of professional men; the dentist or physician who does not perform his operations antiseptically will be relegated to the past by his own acts; he is fossilized by a lack of education.

A general anesthetic is not indicated, as this operation is painlessly performed by the use of a hypodermic injection of $\frac{1}{8}$ of 1 per cent. eucain or of the same amount of cocain; never should over a 1 per cent. solution of either of these anesthetics be used in any condition. I prefer the eucain to all local anesthetics.

After the parts are anesthetized, a lancet is used to cut between the teeth. This will be a guide to the operator, so that when the electric or an actual cautery is applied he will not destroy any of the pericemental membrane of either tooth. It is not necessary that any of the alveolar process be destroyed; only the abnormal amount of muscular tissue should be removed between the teeth. The object of this cauterization is to stimulate the formation of scar tissue; moreover, the approximal fibers are drawn together, and the cicatrix thus formed aids in retention. The cause of the separation of the centrals is removed, and nature does the rest.

POST-OPERATIVE TREATMENT.

The soreness is allowed to subside and annealed brass wire of No. 31 gage is used to encircle the spurs, and the wire is twisted a little every third day. It will then be but a short time until the space is closed. Rubber ligatures should never be used, as they make the teeth too sore on account of the continual pressure, and besides, the amount of pressure that is applied in using rubber cannot be judged.

The lateral incisor will move proportionately with the centrals, on account of the attachments of the fibers at the gingival third that attach from tooth to tooth; the work can be done painlessly in this manner.

At the same time a V-shaped piece of the muscle should be cut out, and at the visits of the patient the lip should be gently manipulated, so that the parts will not grow together; the attachment of the muscle is forced higher on the alveolar process and also on the lip, so that in using the lip afterward in talking, the fibers will not be moved that go between the teeth.

After the teeth are drawn together, let them rest for a few weeks, so that all tenderness may disappear. Then bands for each central are made, soldered together at their incisal portion only, and then cemented in the manner described before. These bands are to remain undisturbed in this position for at least a year or more, the time of retention depending upon the age of the patient and the occlusal contact of the teeth.

PROCEEDINGS OF SOCIETIES.

NATIONAL DENTAL ASSOCIATION—SOUTHERN BRANCH.

Thirteenth Annual Meeting, held at Houston, Texas, May 4, 5, and 6, 1910.

WEDNESDAY—*Morning Session.*

THE thirteenth annual meeting of the Southern Branch of the National Dental Association was called to order in the auditorium of Turner Hall, Houston, Texas, May 4, 1910, at 10 o'clock A.M., by the president, Dr. J. E. Chace, Ocala, Fla.

Rev. J. L. GROSS, pastor of the First Baptist Church of Houston, invoked Divine blessings upon the deliberations of the association.

Dr. Chace then introduced Hon. J. Z. GASTON, mayor *pro tem.* of Houston, who welcomed the association on behalf of the city of Houston.

Dr. JULIAN SMITH, Austin, president of the Texas Dental Association, welcomed the association on behalf of the state society.

Dr. W. E. WALKER, New Orleans, responded to the addresses of welcome.

Dr. Julian Smith, president of the Texas Dental Association, was called to the chair, and the president, Dr. J. E. CHACE, Ocala, Fla., read his annual address.

After some discussion of the recommendations in the President's address, Dr. W. G. MASON moved that the chair appoint a committee of three to consider the President's address, formulate proper resolutions in regard to the recommendations, and report to the society at a later session.

The motion was carried, and the following were appointed by the chair as such committee: Drs. W. G. Mason, C. M. McCauley, and J. P. Corley.

Dr. Chace then resumed the chair.

Motion was then made and carried to adjourn until the afternoon session.

WEDNESDAY—*Afternoon Session.*

The meeting was called to order Wednesday afternoon at 2.30 o'clock by the president, Dr. Chace.

The first order of business was the reading of the minutes of the previous session by the recording secretary, *pro tem.*, Dr. W. G. Mason, who also read the minutes of the last annual meeting.

Motion was made and carried that the minutes be approved as read.

Dr. Julian Smith was called to the chair, and the Committee on the President's Address made their report.

The Executive Committee announced that the Thursday morning session would be devoted to the Oral Hygiene Committee, Thursday afternoon to clinics, and the evening session to the public Oral Hygiene meeting.

The Executive Committee presented the following resolution:

RESOLVED, That a memorial service be held this afternoon at five o'clock in honor of our departed friends and co-workers, Drs. J. Y. Crawford, Nashville, Tenn.; H. R. Jewett, Atlanta, Ga.; W. G. Whitsett, Lebanon, Tenn.; D. H. McNeil, Athens, Ga., and that

when we adjourn, we do so in honor of their memory.

The report of the Executive Committee was adopted.

Dr. J. A. Gorman, New Orleans, chairman of the Committee on Orthodontia and Oral Surgery, reported a number of papers from his section, which were presented in regular order.

The first paper was one by Dr. P. A. Skeen, Texarkana, Ark., entitled "Orthodontia," as follows:

Orthodontia.

It affords me no little pleasure to have been asked by Dr. J. A. Gorman of New Orleans, chairman of the Orthodontia Committee, to read a paper on this important occasion; important for the fact that we have never had a meeting like it, composed of the talent of a progressive, up-to-date, learned profession which has a right to feel proud of its attitude toward the public and of its station among its peers.

The practice of orthodontia fills such a vast scope that I would not have time to do otherwise in the short time allotted me than mention some points briefly. The history of orthodontia, ancient and modern, is familiar to every member of the profession. Surely orthodontia, from every viewpoint, as it is now being practiced, is a godsend to the laity, but not appreciated as it should be for want of information as to its possibilities. Our profession must maintain its dignity, but is surely handicapped by the ethical code, being barred from imparting valuable information outside the office, although the public looks to us for such information as the profession is in possession of and will give out. The public, it seems to me, need more enlightenment on orthodontia than on any other branch of our profession.

Many reasons exist for the non-appreciation of the possibilities in the practice of orthodontia. Mostly the specialist serves the younger class of patrons. I have found it difficult to get them to see and realize the importance of the ordeal, as at that age patients dislike anything that looks like a dental operation. Neither do the parents know what can be accomplished by orthodontic measures.

Another important point is proper compensation for services rendered. Parents seldom take their children with deformed mouths to the dentist as they would to the oculist, and say, "Doctor, if you can do anything for this child, do it," expecting to render adequate compensation. On the contrary, the specialist must explain, and in doing so he should mention a fee, and be sure to ask enough, for he must make good the undertaking.

It matters but little what apparatus is used, as long as it is the right one. A tooth can be moved with almost anything, a strand of grass rope, rubber bands, thin metal strips with a little spring in them, frequently even finger pressure. For various reasons I sometimes extract in order to correct malocclusions. To be successful in this specialty, one should have the elements of an artist as well as those of a dentist and mechanic. The operator, before starting the treatment of a case, should be able to draw mental photographs of how it should look after the operation, and not just "know what to do and do it."

To stay well within the range of ethical practice, it is difficult for the average dentist to do much in this specialty; notwithstanding the need of orthodontic work being done by the average dentist, it is sometimes better to refer the patient to the specialist. The possibilities of this practice are almost boundless, and when it is more fully understood and appreciated, the efficiency of dentistry will be more fully established. It is up to the ingenuity of the National Association to say just how the public shall be educated along these special lines without at the same time digressing from the established rules.

Discussion.

Dr. J. A. Gorman, New Orleans, La. I do not like to antagonize Dr. Skeen,

as I did not read the paper, but I should like to make one or two remarks in regard to it. The essayist spoke of the ordeal of correcting malocclusion. I do not find it an ordeal, nor do my patients. They seem to become very much interested in the work, and it is carried along without any trouble or inconvenience.

The essayist also spoke of extraction. I see no reason for extracting excepting supernumerary teeth. If a case is properly studied, there is no excuse for extraction.

Dr. W. E. Walker, New Orleans, La. If by the word ordeal the essayist means pain, I think the practice of orthodontia as an ordeal is past, but if he means the inconvenience of wearing an apparatus, that of course is usually necessary. It is a never-to-be-desired necessity that causes some inconvenience in spite of all we can do, therefore all possible efforts should be made to prevent malocclusion. If the laity only knew the measures, and carried out the information to be obtained from the profession today, nine out of ten cases of malocclusion could be prevented. This should be done, if for no other reason, in order to avoid the inconvenience of wearing a regulating apparatus and the expense and expenditure of the patient's time, but as to orthodontic treatment being a painful ordeal, that day is passed, if such treatment is administered by competent men and with the proper apparatus.

Dr. J. L. Buchanan, Bonham, Texas. The essayist spoke of extraction in regulating. If teeth are extracted, the arch contracts and an abnormal condition is noted in and around the mouth; such conditions are more noticeable around the mouth than in any other portion of the face. The extraction of teeth allows the lips to drop in and the face loses character.

Dr. G. W. Staples, Dallas, Texas. As far as regulation of malocclusion being an ordeal is concerned, I would like to say that I believe it to be an ordeal both for the patient and for the operator. It may be possible that the days of pain have passed for the operator, but I want to make the assertion that the days of pain have not passed for the patient. I did a little experimenting in my own mouth, and if a man works for himself he is usually rather gentle. There is still a good deal of pain connected with regulating work, not so much in the movement of the teeth itself, but the patient has great difficulty in masticating such articles of food as soft-boiled eggs and milk —there are times when he cannot masticate these with any degree of comfort whatever.

As far as the extraction of teeth is concerned, I do not believe that any practitioner can say that we should not extract teeth at all. Orthodontia is the widest field in the practice of dentistry today. Never were there two cases alike, and never will there be, and it depends entirely on the ingenuity of the individual as to what the results as well as the procedure shall be. There are cases in which, in my opinion, extraction is necessary for a satisfactory result. I do not advocate, but condemn, promiscuous extraction of teeth in regulating. Ordinarily we can correct malocclusion without it, but if one maintains that we should never extract in regulating teeth, I believe that he has either failed to meet with a case of that kind, or is adhering entirely too closely to his textbooks. Theory is good, but we can forget and do without a lot of it. It is only the theory that will work out in practice that is worth anything. I recall one case of correction in which I made a most miserable failure because I did not extract, and I have seen in my practice possibly only three cases in which I deemed it necessary to extract teeth for the correction of an irregularity, but I believe there are a good many cases in which we cannot get good results without extracting.

I wish that practitioners would really take more interest in the subject of orthodontia. It is one of the most important and one of the widest fields we have in dentistry, and yet a vast number of dentists will not encourage the parents of children to put them under their care for orthodontic treatment, because it

causes a great deal of trouble, and they do not care to undertake a regulating case on that account. The possibilities of regulation are unlimited if cases are treated in time, but most dentists put off such treatment too long simply because they do not care to trouble with it. The children who are undergoing orthodontic treatment invariably present at the time when we are busiest, when they have very likely broken some part of the appliance that needs to be adjusted immediately, but which is often allowed to go for three or four days after the appliance is broken. The taking care of these cases is a serious matter and one that causes a good deal of worry, yet they can be handled in a way that is not altogether unpleasant if we approach the patient properly. It has been my experience that when the work is begun, the children enter into it enthusiastically and come regularly, but in a month or so they begin to tire, do not come regularly, and their smile is entirely gone. On the whole, the work causes a great deal of trouble and little pleasure, but I think we should do more of it and encourage the parents to pay more attention to it, for the welfare of the children of the present and the future generations.

Dr. Skeen (closing the discussion). Probably it is my fault, but unfortunately the patients who come to me for that kind of work are timid. That, however, may be a good quality; I rather believe that it is; but it is hard for me to induce a girl of fourteen to submit to any dental operation. When the patients grow a little older, they change somewhat. I know that in spite of decayed teeth, which they are perfectly aware should be treated, they are absolutely afraid of the dentist. Dental work is an ordeal to those people, and the dentist must not only talk to the child but to the parents, and he cannot very well do that outside of his office. When the children have fathers and mothers who know nothing of the possibilities of what can be done, how can they know that anything can be done that will benefit them. The ethical practitioner cannot go to a man and tell him that his child needs dental work. That would be lowering the dignity of the profession. We have to let patients come of their own accord. If a girl has a deformity of the mouth, who is going to inform her mother or her father? Her mother does not know it, and the father does not care, because he is busy attending to business. If we could tell that mother that we could do thus and so, we could probably do some good for these unfortunate children, but we have to wait until they come to our offices, and then we can talk as we please. Another factor that we meet is that social customs interfere with the wearing of an appliance in the mouth.

As regards extraction, I do not believe any practitioner who does very much orthodontia can get along without extracting teeth occasionally. I have found teeth that could not be moved to their normal position at all, and I only claim that occasionally teeth should be extracted for the purpose of regulating. I do not do very much work of this kind, simply because not many cases present to me, but I believe the time has come when more of it should and will be done by the general practitioner. As the last speaker has said, the general practitioner generally avoids this kind of work. I do not believe that half the dentists can indicate what ought to be done. Malocclusion is frequently a deformity that they are accustomed to as well as the patient. Children sometimes lack the bicuspids, and do not know that teeth are missing unless some dentist tells them.

The next order of business was a paper by Dr. J. M. Murphy, Temple, Texas, entitled "Treatment of Fractures of the Maxillæ."

[This paper is printed in full at page 981 of the present issue of the Cosmos.]

Discussion.

Dr. Bush Jones, Dallas, Texas. I always thought that Temple was a law-abiding community, but from Dr. Murphy's paper I would judge that its people are a very scrappy lot. I did not believe

that there had been so many fractures in the whole state of Texas. I do not think we have had more than three or four in Dallas in the past fifteen years.

I wish to congratulate Dr. Murphy on his paper. My experience with fractures is very limited, and those that I have had to deal with have given me a great deal of trouble, which Dr. Murphy does not seem to have had. If I happen to get my maxilla fractured I am going to look up Dr. Murphy.

Dr. S. M. Myers, Cleburne, Texas. I agree with the essayist that most of these fractures occur on the left side. I have had some six or seven cases in my practice, and with one exception, all have involved the mandible on the left side, the exception being the right side in the upper jaw. Why this is the case I do not know. I recall that in one case a man met an antagonist in the road, and was struck on the right side of the lower jaw, and the jaw was fractured in the bicuspid region on the left side. Another case which I treated was that of a man who was struck on the left side, the jaw breaking on the same side. A little boy about a year old was brought to me sometime ago; the mother had left the baby in its buggy on the porch and had neglected to scotch the wheel. The buggy rolled off the porch, the baby was spilled on the ground, and his lower jaw was broken on the left side. In the treatment, I simply reduced the fracture and, strange to say, in a few days only a little swelling was left. I simply instructed the mother to keep the baby from lying on the injured side of the face, and to see that no pressure was brought to bear on the jaw.

Why these fractures occurred all on the left side of the mandible, I do not know, nor whether other members of the profession have had the same experience.

As to Dr. Jones' remark about Temple being a scrappy town, I can say that few of these cases which Dr. Murphy mentioned came from my town, being men from the Santa Fé railroad shops.

As to the essayist's technique, and as to the cases being so easily managed, in a paper like this the essayist of course cannot give the minute details of every one of his measures. Some of the cases get along nicely, and others are hard to treat. If we have a patient with a fracture and he wants to do right, he will help the dentist a good deal in the treatment of the jaw; if not, the dentist will have difficulty with him every time. There is always more or less trouble in the treatment of these cases, and ingenuity, skill, and good judgment are required.

Dr. J. P. Gray, Nashville, Tenn. I was glad to hear Dr. Murphy say that he wasted no time in the reduction of fractures. It is often very difficult to reduce a fracture if treatment is delayed any length of time after it occurs. Immediately after a fracture occurs, the muscles become rigid, and if treatment is delayed for a number of days it becomes necessary in many cases to administer an anesthetic to reduce it.

The essayist did not tell us all, with reference to making these appliances for holding the fractured bones in position. He did not say that in some cases he had to make the cast over, for example, in cases where the short end of the bone was drawing up, and the long end dropping down. The operator cannot bring the fractured ends of the bone together without cutting the impression and reforming it, and then, with the appliance in position, he can draw the two ends of the bone together.

I have found from considerable experience with fractures, that they occur usually between the first and second bicuspids. In nearly all the cases that I treated as dental surgeon for a railroad and in a hospital, where a great many such cases present, the fractures occur at this point, due, as a rule, to a blow on the side opposite to the fracture.

The essayist is correct in stating that after a few days the patient can be dismissed until the time for removal of the splint, but of course in a compound fracture more attention is necessary. Among the large number of cases I have treated I have never seen one fracture in an edentulous mouth during the entire ten years that I was doing work as railroad

surgeon, that immunity being due to the yielding nature of the parts.

I do not know why so many fractures occur on the left side. I was of the opinion that they were about equally divided. I can see, however, why the right side is stronger—because as a rule the patient uses that side more. In some of these cases there may be edentulous spaces on the left side of the mouth, possibly due to the non-use of the jaw on that side.

Dr. L. P. Robertson, Marlin, Texas. Dr. Murphy was considerate enough of my opinion of this work to request me to discuss this paper, and sent me a copy of it for that purpose. I read the paper carefully, and was struck with its practical value. Usually papers read on this subject are theoretical. The essayist has made his paper so clear and so practical that almost anyone can understand it, whether he has had any experience with this sort of work or not. Because of his relation with a railroad hospital he naturally has had to treat many more cases than the average dentist would have.

In several cases, Dr. Murphy has applied a method that in my opinion is entirely original with him as far as I know, namely, the use of the Lukins clamp bands with the expansion bar. By the use of these bands, as explained, he is enabled to reduce a fracture and hold it practically rigid. This so simplifies the work that it is unnecessary to make a cast, which is always a trying task in these conditions. By means of this bar and bands on the teeth the operator is enabled to draw the fractured bones into place and hold them rigidly in position. This apparatus is not at all cumbersome, but enables the patient to use his mouth with more comfort than he could with any other appliance. The operator and the patient are also enabled to give prophylactic attention to the case, which fact is worthy of our consideration.

Dr. Murphy (closing the discussion). For Dr. Jones' benefit I wish to relate one case that I have treated since my paper was written, and which is the worst case I have treated so far.

This was the case of a man who was kicked in the face by a horse, receiving nine distinct fractures, five in the upper and four in the lower jaw, not including a fracture of the nose, which I did not treat myself. This case was treated essentially in the same way as the cases mentioned in the paper, and with practically the same appliance. In addition to that I made an appliance of my own. I formed out of soft pine a U-shaped piece to fit underneath the jaw, and with the Angle head-gear this was drawn up tightly so as to hold the lower jaw in position. The difficulty consisted in getting the upper bones into position, and the only way to do that was by closing the mouth, making the lower teeth act as a splint for the upper, which was accomplished by bandaging the jaws together. The second day after the fracture was reduced, the patient developed facial erysipelas, with a temperature of 105°, and for a week it looked as if he would die; but finally he rallied, and today he has a fair occlusion. I took out a segment of the lower jaw between the lateral and central on one side and the canine and lateral on the other. I have not yet removed the appliance, but the patient is getting along and is in splendid condition.

I wish to thank you all for the kind consideration given to my paper.

The next order of business was a paper by Dr. T. G. Bradford, Dallas, Texas, entitled, "Surgical Operation of the Frenum Labii Superioris."

[This paper is printed in full at page 986 of the present issue of the Cosmos.]

Discussion.

Dr. Bush Jones, Dallas, Texas. This interesting paper treats of a condition that occurs in practice more often than we think. Only a few years ago Dr. Bradford brought to my attention a case in which there was separation between the incisors, and also the method of treating it. After this demonstration I noted this condition in my practice repeatedly. In the past two months I have had two such cases. I find it difficult

to convince the parents that this operation will overcome the trouble, and also that the condition is abnormal. To illustrate that, there is a family in our city, the father being one of the best business men in the city and the mother a club-woman. They had a daughter of fourteen years of age, who came to me, and I told her to ask her mother to accompany her the next time she presented. I showed the mother the trouble, and after explaining it to her as best I could, she turned to me and said, "Doctor, do you think that is the cause of it?" I told her that was what the men who regulated teeth said to be the cause, and that I had seen this trouble corrected several times by correcting that muscle. The mother then told me that she had the same condition, and that her mother had told her that it was a sign that "she and her mother were to live far apart." Gentlemen, that is an actual occurrence, and it happened with one of the best educated women in our city. As I said, the main trouble lies in convincing the parents that this is the cause of the trouble. The correction can be made, as Dr. Bradford has stated. We see these cases frequently, but do not always give them due notice. In many cases the child cannot raise the lip as high as the gingival border of the teeth, but after the operation the lip is normal, and the teeth come together in the proper way.

I wish to thank the essayist for his paper, because it treats a subject that we should all be interested in, and one that we should profit by.

Dr. W. O. Talbot, Biloxi, Miss. I have had some experience in the treatment of this trouble, and I find that with young patients below twelve years, I have little trouble in holding the teeth in position after using the cautery. I find the operation quite difficult, however, in older patients of twenty years or more, when the bones are well formed. In some of these latter cases I have held the teeth in good occlusion for a year, but when the appliance is taken off, they finally drift back to the old positions. I have not been able to overcome that trouble in some cases. There are a great many, however, that can be treated successfully, and I think the earlier we treat the cases, the better results will be obtained.

Dr. W. C. Smart, Edgewood, Texas. In one case of this kind I obtained beautiful results. I have another case on hand now about which I wish to ask some advice. I have a little girl of twelve years of age for whom, about a year ago, I extracted a deciduous lateral incisor. As yet she has no permanent lateral incisors, and the centrals are about one-eighth of an inch apart. The question I wish to ask is: Would you draw these teeth together, or wait until the lateral incisors come in?

Dr. Bradford's paper has been of much benefit to me. I have studied this condition quite a good deal, but as yet have not reached the point where the cautery has been of so much help to me as suggested by Dr. Bradford. My method is to remove a portion of the gum with the lancet, and I have had beautiful results in some cases.

I should like someone to give me a suggestion with regard to the case mentioned, in which the laterals have not yet erupted.

Dr. Gorman. How old is the patient?

Dr. Smart. Twelve years.

Dr. Gorman. When you move the lip, does the under portion move?

Dr. Smart. Just a little.

Dr. Gorman. If there is a decided movement in that lower end of the frenum labii in moving the lip up and down, then I would suggest bringing the teeth together, as that would possibly hasten the eruption of the laterals.

Dr. Talbot. I should like to suggest that it might be well in that case to have an X ray made to determine whether or not the laterals are in the jaw. If they are, I would advise the pulling together of the centrals to make room for the laterals, and holding them, and, if they are not there, make plans for later bridge work.

Dr. L. P. Robertson, Marlin, Texas. Answering the question of Dr. Smart in regard to the absence of the laterals, it is of course easily found out by an

X ray whether or not the lateral incisor will ever erupt in the patient. It is very probable that the patient may have no laterals. As we all know, these teeth are absent more frequently than any others. There is no occasion, however, in my opinion, why Dr. Smart should wait to draw the centrals together. It will have to be done some time, whether that patient has laterals or not. If the laterals finally do erupt and there is no space for them, they will move out to the front, but I fear that the patient will have none. If the laterals do not appear, the spaces will have to be filled with artificial substitutes. We have all seen cases in which the laterals were absent, and if these cases are allowed to go on without treatment, a considerable space always results between the centrals, causing a very disagreeable disfigurement in the upper arch. My idea is that the sooner we can treat these cases the better, and I deem it wise to expand the jaw and make plenty of room for the laterals. This ought to be done as early as possible to keep the canines from moving forward and occupying the place of the laterals. If that happens, when the patient is sixteen years of age there will be difficulty in retracting the teeth and making space for the laterals. We know that this is an absolutely necessary measure in order to obtain a symmetrical appearance in the fulness of the mouth, and I would not delay the drawing of the centrals together.

Dr. Bradford (closing the discussion). As far as this model [demonstrating] is concerned, with reference to the condition that caused the separation, this was intensified by the absence of the lateral incisors. Seldom do we see such pronounced malocclusion as this, and the real seat of the trouble is in this lip. In working the lip the fibers of this muscle come between the teeth, and it is these dense inelastic fibers which, when the teeth are brought together without modifying, will draw the teeth back. My method is to cut a V-shaped space out of this muscle; when this is done, the attachment is thrown higher on the process, and after it is cut out, the lip should be lifted up and cauterized so that the fibers will not come back together. This incision should be made in the central part, so that when the cautery is used, it will not destroy the pericemental membrane. It is not necessary to destroy any of the process by the cautery, as it is only the abnormal muscular fibers that cause the trouble. Another condition which is overcome by this operation is the impediment in speech due to the escape of air between the teeth.

In reply to the question with reference to the central incisors, the time to begin the treatment of any case of malocclusion is as soon as it manifests itself, and the operator should always know what he is going to do. If the lateral incisors have not erupted, a skiagraph should be taken, which will disclose whether these teeth are present in the jaw or not; but in any event, the teeth should be placed in their proper position without delay.

The President then announced that pursuant to the resolution presented by the Executive Committee, a memorial meeting would be held at this time in honor of the members of the association who had died since the last meeting.

At the request of the president, Dr. H. C. Hassell read a biography of Dr. J. Y. Crawford, Nashville, Tenn., written by Dr. Burton Lee Thorpe of St. Louis, as follows:

In Memory of Dr. James Young Crawford.

The telegraph flashed the sad news of the sudden death of my friend. I wipe away a tear and pen these words to his memory, not that they will benefit him, for he well knew my high regard for him in his hours of life and health, but that those who read these lines may know of his generous nature, his worth, and his earnestness in the promotion of dental surgery, his chosen calling. His death occurred at Nashville, April 5, 1910, and was caused by angina pectoris, with which he had suffered for several months. He virtually died in the harness, as he had often expressed a

wish to do. Funeral services were held at his late residence, 1910 Belmont Circle, Nashville, at 2.30 P.M., April 6th, Rev. W. B. Taylor and Rev. E. B. Chappell officiating. The burial was at Mt. Olivet cemetery, with the following pallbearers: Honorary—Chancellor James D. Porter, Governor M. R. Patterson, Dr. J. B. Stephens, Major E. B. Stahlman, Hon. Benton McMillin, Dr. S. B. Cooke of Chattanooga, and Dr. William Crenshaw of Atlanta, Ga. Active—Dr. Duncan Eve, John W. Thomas, E. R. Richardson, P. A. Shelton, Dr. J. A. Witherspoon, W. E. Norvell, Dr. Stanley L. Rich, and Dr. W. W. Core.

James Young Crawford was born in Hawkins county near Rogersville, Tenn., June 2, 1846. He was the son of Rev. J. Y. Crawford of the Holston Conference M. E. Church South, who was one of the prominent preachers of the South in ante-bellum days. Young Crawford's boyhood was spent in West Tennessee. Owing to the war between the states, he had no school advantages after his twelfth year. At the age of fourteen, at the outbreak of the war, he enlisted in the Confederate army, serving in the commissary department in Florida for four years. At the close of the war he went to Bowling Green, Ky., where he studied dentistry under the tutelage of Dr. J. E. Breeding. Following this he located at McKinzie, Tenn., where he practiced until 1879, when he removed to Nashville, and soon took rank as a leader in the profession, and for years has stood distinctly as one of the foremost dental surgeons in the South. In 1879, '80, and '81, he attended the medical department of the University of Tennessee, from which he received the M.D. degree. Later he served on the medical faculty as professor of dental and oral surgery. Dr. Crawford always maintained that dental surgery is a *bona fide* department of medicine and surgery and should be practiced as such, believing that of all specialties of medicine, the dental surgeon needs fundamental education in medicine more than any other special practitioner. The honorary degree of D.D.S. was conferred upon him at the first annual commencement of the University of Tennessee, Dental Department, in 1879.

In 1878 he was one of the demonstrators of operative and mechanical dentistry in this college, and in 1879 was professor of mechanical and corrective dentistry. In 1883 he was elected dean of the faculty and professor of operative dentistry, serving in this capacity until 1889. During the session of 1890 and 1891 he served as professor of clinical dentistry and oral surgery in the Dental Department of the Vanderbilt University. In 1905 he again became connected with the University of Tennessee, Dental Department, and was elected president of the faculty and professor of clinical dentistry, serving in this capacity until his death.

It was characteristic of Dr. Crawford that he always supported dental association work. He was a member of the Tennessee State Dental Society, and its president in 1883. In 1891 the state legislature passed an act to regulate the practice of dentistry in the state of Tennessee, and authorized the appointing of a state board of dental examiners. Dr. Crawford was a member of this board and its first president. He served in this capacity until 1894. In 1893 he was vice-president of the National Association of Dental Examiners. Dr. Crawford was active in the Southern Dental Association and served as president at the annual meeting at Galveston, Texas, August 30, 1889. He also was a loyal and active attendant of the American Dental Association, and was twice elected its president, in 1894 and again in 1895. He presided as chairman at the Horace Wells memorial meeting held at Philadelphia in 1895. In his President's address of the American Dental Association in 1895, he urged the union of the Southern Dental Association and the American Dental Association, to be known as the National Dental Association. Later he was a member of the committee of five appointed by the American Dental Association, and was prominent in bringing about the fusion of these two societies into the present

National Dental Association at Old Point Comfort, August 5, 1897. He took a prominent part in this association, serving almost continuously as a member of its executive council until 1908. He also served on many of the prominent committees of the association and of the Southern Branch, in which he took a particular pride. Dr. Crawford was a member of the committee on organization of the World's Columbian Dental Congress held at Chicago 1893, also a member of the committee on organization of the Fourth International Dental Congress, St. Louis 1904, and honorary president and chairman of the committee on resolutions of the same. The last dental gathering that he participated in was the Fifth International Dental Congress at Berlin, August 1909, to which he was a delegate representing the National Dental Association. He was honorary president of the Jamestown Dental Convention in 1907, and had been elected an honorary member of practically all of the southern state dental societies, and granted a license to practice in several of the southern states. He was a member of the American Medical Association and the Nashville Academy of Medicine and Surgery, and an honorary member of the St. Louis Society of Dental Science.

Dr. Crawford took an active interest in the professional associations and organizations; especially was he prominent at all national and at many state and local gatherings, where he took prominent part in the discussions and executive work. For years he has been known as "the silver-tongued orator of the South," and justly deserved the title, until the last few years, when failing health impaired his voice. His most notable addresses of late years were delivered at the opening session of the Jamestown Dental Convention in 1907 and at the opening session of the National Dental Association, Birmingham, 1909; both were eloquent and patriotic appeals for high ideals in our profession.

Dr. Crawford was a good citizen; he was possessed of a genial disposition, and had won a large circle of friends not only in his profession but among the people generally, who admired him for his charming personality and the deep interest he ever manifested in the welfare of his state and city. He was a member of the Methodist Church, South, holding his membership in McKendree Church at the time of his death, but for a number of years, while a resident in the west end, Dr. Crawford was one of the officials of the West End Methodist Church. He was ever ready and willing to contribute liberally of his means to the promotion of the church's work. In politics he was a democrat, and of late years attended all the national conventions of the democratic party.

In 1885 Dr. Crawford married Miss Louise Haggard, daughter of the late Dr. W. D. Haggard, and a sister of Dr. Will D. Haggard, Jr., of Nashville. He is survived by his wife and three children—J. Y. Crawford, Jr., Jane Douglas, and Mary Louise.

Dr. Crawford held superior rank as a skilful operator, and was always eager to instruct members of his profession. His patients were most loyal and appreciative, and frequently would respond to his telephone requests to call at his office to show some visiting dentist some particular operation he was anxious to demonstrate. We who have enjoyed the privilege of being guests at his hospitable home could but admire his devotion to his interesting family. As wine warms one's blood and love warms one's heart, so did the spirit of devotion to his profession predominate in his career, overshadowing all else except his devotion to his wife and children.

He has been an inspiration to many young men, and did much both financially and by advice to aid them to acquire a dental education and to start in practice. He always urged them to become identified with dental society work, of which he was probably the greatest exponent in the southern states.

Dr. Crawford was one of the kindliest men in the profession. He was a good lover and equally a good hater, but a generous one, without the malice that

rankles with most men who have detractors.

As I knew and appreciated him, he exemplified the following sentiment: "He has achieved success who has lived well, laughed often, and loved much; who has gained the trust of pure women and the love of little children; who has filled his niche and accomplished his task; who has left the world better than he found it, whether by an improved poppy, a perfect poem, or a rescued soul; who has never lacked appreciation of earth's beauty or failed to express it; who has always looked for the best in others and given the best he had; whose life was an inspiration, whose memory a benediction."

Dr. W. G. Mason moved that the association extend to Dr. Thorpe a vote of thanks for his valuable contribution to the memory of Dr. Crawford.

Motion carried.

Dr. J. D. Towner moved that a committee be appointed to draft resolutions on the death of Dr. Crawford, to be spread upon the minutes of the association, a copy of it to be transmitted to Mrs. J. Y. Crawford, with the sympathies of the association.

Motion carried.

Wednesday—*Evening Session.*

The meeting was called to order Wednesday evening, at 8.30 o'clock, by the president, Dr. Chace.

The first order of business was the reading of a paper by W. E. Walker, New Orleans, entitled "Oral Hygiene in Public Schools."

[This paper will be published in a later issue of the Cosmos.]

The next order of business as announced by the President was a paper by Dr. A. H. Ketcham, Denver, Colo., entitled "Are the 'New School Orthodontists' Practicing Excessive Expansion?" and read by Dr. J. A. Gorman.

[This paper is printed in full at page 955 of the present issue of the Cosmos.]

Discussion.

Dr. P. A. Skeen, Texarkana, Arkansas. I am glad to see that people differ in opinion. I admit that this paper was written by an able man in this specialty; his suggestions are different from those I made in my paper, but that does not make it a law that there shall be no extraction whatever, no matter what the conditions or where the teeth are. I have extracted teeth that never saw daylight until I took them out. I have extracted some that were wrong end to, to use a familiar expression, and I did that not more than six weeks ago. The crown was where the root should have been. If, in a case of regulation, we find such an inverted tooth, we should, in my opinion, use the forceps—that is where we need "forcepitis." We should be prepared to do this work of orthodontia, when a patient who needs it presents. I want to take exception to the statement that extraction should be absolutely condemned at all times.

Dr. J. P. Corley, Greensboro, Ala. I have had the misfortune of being *in*flicted with "forcepitis," as my face shows, and I also have had to go to the rhinologist to have a part of a deflected septum removed in consequence of that "forcepitis." I should therefore feel like having my tongue cut out if I kept my seat when such an issue is at stake. I have for years claimed that only the complete denture will maintain a perfect facial balance and produce perfect nasal fossæ and environment, and have during the past winter submitted this proposition to fifteen dental schools in this country, asking them to adopt in the societies a resolution that they educate their students to the necessity of avoiding these sequelæ of extraction performed in patients under twenty years of age. I hope that Dr. Skeen will live to see the day when he will regret that he made his statement of this evening. He has a well-balanced face, and is a good-looking man, and can afford to

speak that way, but I cannot. I have been laughed to scorn in my own society and in this society for making these statements, but I hope to see the time when men like the essayist present data proving to any reasonable man that teeth were never meant to be extracted from the human or any other mouth.

Dr. Skeen. I am surprised at Dr. Corley's taking the floor and trying to make this assembly believe that the forceps had anything to do with inflicting his physiognomy on him.

The following papers were read by title:

"Orthodontia," by E. A. Bogue, D.D.S., M.D., New York, N. Y.

"The Duty of the General Practitioner Toward Cases of Orthodontia which Occur in His Practice," by Dr. H. E. Kelsey, Baltimore, Md.

"The Necessity of Early Correction of Malocclusion," by Dr. W. E. Wilson, St. Louis, Mo.

[These papers will be published in a later issue of the Cosmos.]

Motion was then made and carried to adjourn until Thursday morning at 9 o'clock.

(To be continued.)

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Forty-second Annual Meeting.

First Day—*Morning Session.*

The forty-second annual meeting of the Dental Society of the State of New York was opened on Thursday afternoon, May 5, 1910, at Odd Fellows' Hall, Albany, N. Y.

The president, Dr. B. C. Nash, New York, called the meeting to order at 2.30 o'clock.

The President called for the reading of the minutes of the last meeting.

The secretary, Dr. Hillyer, moved that inasmuch as the minutes had been published, the reading of the same be dispensed with. The motion was carried.

The vice-president, Dr. A. R. Cooke, occupied the chair, while the president read his annual address.

Dr. Nash then resumed the chair.

Dr. A. H. Merritt, New York city, read the report of the Committee on Practice, as follows:

Report of Committee on Practice.

One year ago your Committee on Practice expressed the hope that the time may not be far distant when a report on dental practice would consist largely in a description of the methods whereby those conditions of the general system underlying the diseases of the mouth and teeth are controlled, and that the dental practitioner of that period would find his time more occupied during his year's work in the maintenance of health than in the combating of disease. That time has not yet come.

So far as can be ascertained, diseases of the mouth and teeth are as prevalent in this year 1910 as when, threescore and eleven years ago, the dental profession of America first opened its eyes upon a world where dental caries was well-nigh universal.

Recent investigations have revealed the fact that not less than 95 per cent. of school children between the ages of

six and sixteen are suffering from decaying teeth and unhygienic mouths. So nearly universal is caries of the teeth that it has been characterized as the "people's disease."

Among adults, even in this day and generation, pyorrhea alveolaris is responsible for the loss of multitudes of teeth, and the indirect cause of unnumbered ills more or less seriously affecting general health.

While it is true that more teeth are being saved today than have ever been before in the history of the world, and that as a consequence of this the average duration of human life has been increased, the dental profession has still to confess that these achievements are due largely to improved technique in what may be termed "reparative" dentistry.

Preventive dentistry, with nearly all that that term implies, still stands with beckoning finger in the dim but, let us hope, not distant future. And I think we may be encouraged to believe that the time is not far distant when preventive dentistry, in part at least, shall have become an accomplished fact. As evidence of this, note the growing interest in dental hygiene which is manifesting itself throughout the civilized world of today; the interest with which men of science are studying the saliva with a view to ascertaining what are the variations in its constituents which predispose to or restrain dental diseases; the increasing attention which is being paid to the bacteriology, pathology, and treatment of pyorrhea alveolaris, to the subtle and still hidden causes which make for mal-relations of the teeth and jaws. Surely no one need feel cast down or discouraged. Rather should we rejoice that to us it has been given to have a part in the work so potential in its possibilities for good.

Meanwhile, improved technique, with the application of new principles to the everyday practice of dentistry, has measurably increased its field of usefulness and made of it an important factor in the health and happiness of humanity.

THE CAST GOLD INLAY.

One of the agencies through which this has been accomplished is the cast gold inlay. What was before its introduction a tedious or impracticable operation may now be performed with every assurance of success, and with a minimum of strain upon both operator and patient. And herein would seem to lie the one great factor in favor of the gold inlay; not only is it saving teeth and doing it more satisfactorily than it has ever done before, but it is doing more than this, it is saving human life—the life of the operator who in the past poured out his and his patient's life's blood upon the altar of the malleted filling. Think for a moment of what this means every day to multitudes of people throughout the world, dentist and patient, and you will understand what is meant by emphasizing the humanitarian value of the new technique. Out of consideration for the esthetic, the gold inlay finds its legitimate place in the bicuspids and molars, and there, chiefly, in restorations of considerable size. Whether one employs what is known as the "direct" or "indirect" method would seem to be a matter of personal convenience, good results seeming to depend upon the individual operator rather than upon the method employed. Cavity formation and the technique in casting are too well known to require repetition. It is probably not too much to say that the cast gold inlay has taken its place among the recognized methods by which teeth may be restored to health and usefulness, and this without in any way reflecting upon the foil filling.

THE SILICATE CEMENTS.

When we come to a study of the so-called silicate cements, we find ourselves unable to speak with the same assurance. During the last five years no less than seven of these cements have been placed upon the market in the United States, several of which have since been withdrawn because of their proved worthless-

ness. A review of the literature on this subject during the past year is unsatisfactory, ranging from the most enthusiastic indorsement to unqualified condemnation. In most instances no mention is made of the particular cement employed. In the interest of accuracy it is necessary to state that investigation has shown that the preparation most widely used is the one put up by Hugo Ascher, and is the one which seems to be most nearly satisfying the demands made upon such cements.

A careful study of many articles on this subject, supplemented by experience and clinical observation, has led your committee to believe that in many instances unsatisfactory results have been caused by faulty technique, and by the use of the material where it was not indicated. It has no place in large restorations where it will be subjected to masticatory stress, and this is especially true in the anterior teeth, in cavities involving the incisal edge. With few exceptions it should be limited to small approximal and labial cavities, and when so used, with proper precaution, it would seem to be a very satisfactory filling material. Its esthetic value in cavities of this character is superior to that of any other filling material, and while it is yet too early to speak with any certainty of its lasting qualities, its use in the anterior teeth would seem preferable to the permanent disfigurement which too often attends the use of gold. Cavities should be prepared with clearly defined edges without bevel, and retentive in shape. When the cavity is deep, the pulp should be protected with oxyphosphate to prevent thermal shock. Care should be observed to prevent too stiff a mix, the liquid to be carefully stirred at each use. To prevent stains, steel instruments should be avoided. When the cement is placed in the cavity and the edges are carefully covered, it should be allowed to remain fifteen minutes before finishing. This should be done with fine strips and disks slightly lubricated. Not less than thirty minutes should elapse before the removal of the dam. This is of the utmost importance. Before this is done, the filling should be covered with melted paraffin to further protect it from moisture. The application of heat to hasten crystallization is inadvisable, as it is said to cause shrinkage. These are some of the more important details to be observed in the successful use of this material. Care must be taken with every step. With the further improvement which is bound to take place in the manufacture of these cements, with improved technique in their use, it is believed that they will prove a valuable aid in the saving of teeth, and that without the disfigurement which too often attends the use of gold.

PYORRHEA ALVEOLARIS.

Not the least of the encouraging signs of the times as seen in dental practice is the greater attention which is everywhere being given to the study and treatment of pyorrhea alveolaris.

Men are coming to understand that the claim that it is a disease of purely local origin may be as far from the truth as the equally insistent claim that it is systemic and associated with faulty metabolism.

Its etiology is not yet clear, which is due in part to the number of causative factors which may enter into any given case.

Discrimination and a careful study of each case which presents is the first requisite to successful treatment. That there are cases of local origin due to improper mouth hygiene, malocclusion, ill-fitting crowns, poorly contoured fillings, etc., no one who has made any study of pyorrhea can doubt. That there are other cases again where there is little or nothing in the local conditions to explain its origin and development, would seem equally true. These latter cases can only be explained on the more than probable hypothesis that certain systemic conditions act as predisposing influences, and must be reckoned with in the treatment of the disease. More recent investigations into the rôle played by bacteria in disease and the manner in which the body protects itself against infection have led to a renewed study of the bacteriology

of pyorrhea, with a view to ascertaining to what extent the organisms found in pyorrheal discharges were factors in its cause and progress.

A study of a large number of typical cases has revealed the fact that a very large per cent. of these possessed a subnormal opsonic index, by which is meant a subnormal resistance to infection to the organisms found in the discharge. The method employed in the treatment of such cases, and referred to as the opsonic or vaccine treatment, consists in the microscopical examination of the pus for the purpose of determining the nature of the infecting organisms, and the growing of them upon an artificial media, from which the vaccine is prepared. This vaccine consists of an emulsion of dead bacteria in nutrient broth or salt solution, standardized to certain definite proportions. These are hypodermically injected, the number employed depending upon the nature of the infecting organism and the opsonic index of the patient. For the purpose of increasing the patient's resistance to infection, these inoculations are made once or twice each week, during treatment, or until such time as the symptoms attending the disease have disappeared. The result of such inoculations is an increase in the phagocytic activity of the leucocytes, dependent upon an increase in the opsonizing power of the blood serum, and is usually characterized by marked improvement in the disease. While it has been shown that excellent results may be obtained by such treatment, with a more or less complete disappearance of all subjective symptoms, it is too early to predict what place it will occupy in the treatment of pyorrhea. Our present complete knowledge of nature's reactive forces in bacterial infections, the elaborate technique involved in the preparation of the vaccine—requiring as it does the co-operation of one skilled in bacteriological work—very much limit its usefulness. The increasing number of cases reported in this country and abroad in which vaccine therapy has been employed shows a very general interest in this phase of the subject. One thing, however, which cannot be made too clear in this connection, is the necessity for the most thorough local treatment, for upon this depends the final success in every case. Any treatment which does not include this is foreordained to failure.

BIFLUORID OF AMMONIUM.

Probably the most valuable therapeutic agent in the local treatment of pyorrhea alveolaris is the solution devised by Dr. Joseph Head of Philadelphia, and called by him bifluorid of ammonium. In a little more than the year in which it has been available to the profession it has grown steadily in favor, and when correctly used, has more than met every expectation. It may be injected into the pockets before curetment for the purpose of softening the deposits, and rendering their removal less difficult.

Its chief value, however, lies in its injection into the pockets, after curetment has been completed, for the purpose of dissolving the small particles of calculi which have escaped instrumentation, and in its stimulating effect upon the soft tissues involved.

The parts to be treated should be carefully protected by napkins, and the solution, full strength, carried by the use of a small syringe into the depth of the pocket, where it is allowed to remain for two or three minutes before the removal of the napkin, after which the mouth may be washed with warm water. When so used there is little pain attending its use, and no danger from burning. It is not, however, "fool-proof," as is shown by some reports on its use during the year, and should always be used with caution. It has already proved itself to be a most valuable addition to the armamentarium of the dentist, and is bound to meet with increasing favor in the local treatment of pyorrhea.

Dr. Merritt. In the records of the silicate cements, I found, as I have said in the report, that in going over the literature of the subject there was little or nothing to indicate what cement has been used. So in order to test what was their comparative value, I purchased the

different kinds that I could obtain in the city of New York, which were four—the only cements on the market—and I made comparative tests. They were mixed according to the directions given. I made two cubes of each, and kept them dry one hour and thirty minutes, believing that to be the maximum amount of time we could expect to keep them dry with the paraffin wax. They are then immersed in water. I found them to be in the condition which you will observe as I pass them around. I put them in water again, and allowed them to remain thirty-six hours longer, and found no appreciable change. Three of the specimens have completely lost the luster which was present at the time when they were immersed, and three showed a considerable disintegration, that is, a chalky appearance. All of them have bleached out; one of them has cracked open. I did not mention the names, but I will be glad to tell them to anyone or state them publicly, if you wish, by the number which is on the box.

Discussion.

Dr. L. Meisburger, Buffalo, N. Y. In listening to the report of the Committee on Practice we are again reminded that the gentlemen serving on that committee have upheld to a very marked degree the reputation of their predecessors in presenting, as they have, a report treating of matters of the most vital importance and interest to us.

The committee states that, as far as can be ascertained, diseases of the mouth and teeth are as prevalent in 1910 as they were threescore and eleven years ago, and that ninety-five per cent. of school children between the ages of six and sixteen are suffering from decaying teeth and unhygienic mouths, but that it is true that more teeth are being saved than have ever been before, and that these achievements are largely due to improved technique.

The deductions and inferences to be drawn from these statements are not in harmony, I think, with the opinion of those men who have been devoting a fair share of their time to oral prophylaxis as taught by Dr. Smith. If I am not in error, I believe that it is the experience of those following that practice to find a very marked diminution in the number of cavities occurring in those mouths receiving the above treatment.

A word at this point in reference to dental hygiene, which the committee have referred to. We have had fads of many kinds permeate our ranks, only to take wings in due time and return whence they came, and slumber in the archives into eternal sleep; but this movement has been on the horizon for some time, and has finally crossed the ocean, and is now fanning a breeze which cannot be swept aside.

The movement now on foot must have, to insure success, the best efforts and support of every man connected with this noble profession of ours. In order that we may enlist and expect their support, we must refrain from a too generous use of printer's ink in newspaper form, and from attempting in that way to impart to the public the knowledge which should be given by men who are willing to sacrifice and gladly give their time to further the best interest of this worthy cause, by delivering lectures directly to the teachers and pupils of our schools, which does more real good, especially if, as is the case in Buffalo, the lectures are supplemented by lantern slides. This, in conjunction with proper attention to the needs of those inhabiting our institutions, both penal and otherwise, will do much to create a demand for and to bring about a much-needed reform, and give us the financial assistance and recognition from the proper authorities to carry on and extend our work.

In reference to cast gold inlays, I would say that when we hear that an operation of this kind can be performed with every assurance of success I sometimes wonder how these results are achieved—and by that I mean a perfect inlay. To my mind a cast gold inlay with proper cavity formation and subsequent seating and finishing is as difficult to make as a good gold filling, and save

perhaps the expenditure of nerve force on the part of both patient and the operator—and I do not deny that this is worthy of consideration—can be done in the same amount of time. How many men have followed up the work as taught by Dr. Black and so beautifully exemplified by those western gold-builders, to such an extent as to become thoroughly familiar with its technique? Let them give an equal amount of time to both and then give us their verdict.

Much could be said about silicate cement. Opinions and experiences differ greatly. My own conclusion as to its use leads me to say that I think it behooves us to be a bit cautious, especially in allowing our patients to labor under the impression that we are employing a permanent material. Some results would possibly warrant this statement, but many would not. As to the preparation that is at present giving the writer the best results, I would be inclined to favor the Schoenbeck product. Its color is perfect, but as it is a comparatively new product I must at this time avoid a positive verdict for or against it as compared with other preparations possessing like characteristics.

I do not hesitate to use metal instruments, should I so desire, providing they have first been polished on the lathe, in this way removing any oxidation present. I also use and prefer soapstone on the instruments in preference to a lubricant such as vaselin.

In cases where cement restorations have to be made for some reason, such as ill health, or lack of time, the use of the How screw as taught by Dr. McAlpin will greatly aid in the retentive and resistive powers of the filling.

Much can, indeed, be said of pyorrhea alveolaris. It seems to me that we all must agree as to the etiology of this disease, namely, that it is a local manifestation of a systemic disturbance, except in those cases caused by malocclusion, defective fillings, ill-fitting crowns, etc., and should therefore to a certain extent be treated as such. By this I mean, after all deposits are removed and the roots are perfectly smooth, it is our duty to the patient, irrespective of the fact that after thorough instrumentation the inflammation subsides and the pus ceases to flow, to suggest the necessity of consulting a physician, and if any exciting cause exists, to try to eradicate it from the system, so as in that way to prevent a recurrence of the local symptoms, and thereby fortify our work.

Many of these cases have responded and yielded to treatment so readily, especially in that type of well-fed, or I might say over-fed individuals, when saline salts were prescribed, such as sal hepatica in small doses taken three times daily before meals, that I invariably make it a practice to prescribe this treatment for the class of patients who present with a history of rheumatic or gouty diathesis.

By the foregoing remarks I do not, however, wish the opinion to prevail that there are no exceptions to this rule, as we know that pyorrhea also attacks persons of lowered vitality possessing subnormal resistance to infection.

Much has been said in reference to instruments, some laboring under the misapprehension that results can only be obtained with the use of certain instruments. That this is the result of a lack of experience goes without further comment, as any instruments not too large, well tempered, of proper shape to reach all parts of the tooth, backed by a trained hand and a fair supply of good judgment —commonly known as "horse sense"— in conjunction with a man who is willing to devote the proper amount of time —and I want to emphasize the word "time"—can accomplish results. Use whatever medication you will, as nature is generous in its response in coming to our assistance when foreign substances are removed.

I find that warm lactic acid deposited in the bottom of the pockets, and Buckley's pyorrhea astringent, which is Talbot's prescription, as a gum stimulant, give the best results in my hands, after instrumentation has been completed.

When using any acid the tooth must be protected by painting with shellac, which is easily removed with alcohol.

The use of gum, either old-fashioned

rubber or spruce gum, for half an hour twice a day, with instruction to exercise all of the teeth, I think is beneficial.

Dr. H. L. Wheeler, New York city. I want to congratulate Dr. Merritt on giving us one of the most direct and concise reports of a very large subject that I have ever listened to.

In regard to the examination of school children's teeth, which he mentioned, I do not believe that up to the present time there is any great amount of accurate knowledge of the conditions existing in our public schools. An examination for which Dr. Merritt himself was responsible is, as far as I know, about the most accurate statement based upon careful examination that has been made. That was made in New York of children applying for working papers. If we wish to obtain figures that will be utilized by the boards of education and boards of health, it will be necessary for the dentists to do the examining, and not depend upon the physicians employed by the board of health, who, with the best intentions in the world, have often not the dental education or the dental knowledge to discriminate between a deciduous and a permanent tooth. I offer that as a suggestion to those interested in the question of dental hygiene.

In regard to preventive dentistry, the field is so large, and there is so little known and so much to be learned, that one can scarcely say much. I would like to speak of some experiments that have been carried on at Columbia University, in New York city, by Professor Gies, professor of biological chemistry, under the auspices of one of the New York societies, who furnished a scholarship. They have been making an examination of the saliva all through the winter. Dr. Gies recently made a report at the New York Institute of Stomatology, the chief results being, as I saw it, that there is so much to be known and the subject is so complex that no definite assertions can be made as yet, as to the effect of the composition of the saliva upon conditions of decay. I think, however, it was discernible that his experiments had demonstrated that in some cases the mucous plaques are more readily removed by an organic acid than by anything else he had discovered, the inference being that the day may not be far distant when we shall be recommending certain acids to prevent decay. The experiments have not extended far enough to even indicate what the result will be.

The gold inlay seems to me to be a very useful adjunct to the operative dentist. In many instances the amount of cutting required on a sound tooth is so great that I personally could not think of destroying that amount of tooth structure for the sake of any kind of an inlay; in those cases, and in others, it seems to me that the old-fashioned gold filling is not only more desirable, but will produce results that are not exceeded by the gold inlay or by any other filling that has yet been invented. While I occasionally use the gold inlay, I still find it necessary to retain my gold pluggers and use gold foil.

As to silicate cements, I regret that Dr. Merritt neglected to draw a comparison between their use and the use of porcelain. While the porcelain fad has come and gone, and doubtless you could buy a great many electric furnaces for a price little in advance over the original cost of manufacture, still, after fifteen years' constant use of porcelain in cases where I considered its use necessary, I find it quite as useful today as I did when I began. I am using baked porcelain quite as much as ever, and never expect to see the day when I can dispense with it. The edge strength and the tendency of the cement to lose color in certain cases shows itself occasionally, much to the disgust and discouragement of the dentist, if not of the patient.

Pyorrhea alveolaris, while it may be caused by local conditions, in the majority of cases is without doubt due to faulty metabolism. Faulty metabolism covers a very broad field. It takes in the whole question of nourishment from the time when the food passes into the mouth, through the stages of digestion and assimilation, or dis-assimilation, up to the excretions and secretions. That whole field is covered by faulty metabol-

ism—the effects and faults of the metabolic processes, and it is evident to the careful thinker not only that pyorrhea alveolaris has its foundation somewhere within the range of these conditions, but also that caries in the human teeth is due to similar conditions—or that faults in the metabolic processes, faults in the process of assimilation and dis-assimilation, produce the tendency to caries or decay, the same as they do pyorrhea alveolaris. The preventive dentist of the future will, I believe, carry on his preventive work along these lines.

I want to go back a moment to the question of dental hygiene, in which I am much interested.

I agree with the discussion of Dr. Meisburger that the weak point in this work—which I believe is a necessary work and capable of great good both to the profession and to the public—the great danger, is the question of too great publicity. We know little about the question of prevention, which is really the fundamental question of hygiene, and remarks which we may give the public today as authoritative may be found to be entirely erroneous tomorrow. The public does not realize that we utilize such information as we have today, and discard it tomorrow if we find a better one, thankful for the chance of improvement. I believe too great publicity in the public press will often do as much damage to the profession as would result if we refrained from ever publishing anything.

The newspapers are published in such a form that they cannot be kept on file, as a book can. They describe the daily happenings of the universe. To educate you must constantly refer to the statements before you. All of our statements are obtained by iteration and reiteration, going time and again over the things which we want to fix in our minds, without going back each time to the written page. This cannot be done with the newspaper, because nobody will read a newspaper with yesterday's date on it.

I will mention the bifluorid of ammonium because I have used it a great deal. I do not use it as much as I did, for I find that there are certain cases, in pockets with a comparatively obstructed opening, where the possibility of pain is so great that I do not wish to subject my patients to it. I have again and again, despite the most careful technique that I am able to command, caused pain that was well-nigh unbearable for half a day. That may do for a strong and sturdy man; but for people whose nerves are in a state of but medium resistance to the annoyance of pain and trouble, it seems to me that the result obtained, although it is invariably good, is not equal to the wear and tear on that patient's physical welfare. I want to sound a warning, based on an experience of two years at least, against introducing it into too many pockets at once. You may go around all the pockets in a case of pyorrhea with it, and every pocket but one will be comfortable; when you strike that one, you will see the veins on the patient's face stand out, and the tears come to his eyes, and the whole expression will be one that shows the pain to be so great that personally I am unwilling to take the responsibility for inflicting it.

Dr. T. P. Hyatt, Brooklyn. I should like to refer to only one part of Dr. Wheeler's remarks. I know of Dr. Wheeler's great interest in the question of dental hygiene and in the education of the public, but I want to take exception to what he said on the question of the newspaper. I do not think it is necessary to give such careful statements in the newspapers day by day and month after month, and carry them on for a series of years, so as to make every reader of a newspaper a doctor of dental surgery. I think we can give a general idea to the public that dentistry is alive and progressive, and that if it does make a change from the practice of yesterday, it is because it is alive to progress. I do not take the same position of fear in the publishing of the status of dental science in the newspapers. I think the public will gain by a greater publicity in the newspapers than exists today.

Dr. R. H. Hofheinz, Rochester, N. Y. I ought to discuss this paper, because I

have aided as much as anyone to show that Dr. Head's remedy is not "fool-proof," as Dr. Merritt has said. Let me also add a word in regard to the newspapers. While I agree to a large extent with the remarks of Dr. Wheeler, do not let him forget that no nation takes its literature and its education—speaking of the general public—as much from the newspaper as we do in the United States. I believe there is no other civilized nation that gets as much from the newspapers in an educational sense. Many do not have the time—I am speaking of the masses—to go into details, and therefore get their knowledge through the medium of the newspapers.

Dr. Meisburger said that in many instances it takes no more time to make a gold filling than it does to make a gold inlay. I should modify that decidedly, and I think I have manipulated gold as much as anybody of my age in this room. I should say in relation to the size of the cavity it takes more or less time. I can manipulate gold foil more quickly in many cavities than I can make a gold inlay, but when it comes to a large double compound molar cavity where formerly I would have been obliged to crown the tooth, but where I now simply fill up the center of the cavity with cement, I do not believe anyone can manipulate gold foil faster in such a cavity. If gold inlays had done nothing else but enable us to restore the proper occlusion they would remain an immortal acquisition in dentistry.

In regard to silicate cements, I entirely disagree with Dr. Merritt in his most excellent report. My own experience has been most unsatisfactory. I have in mixing followed both the technique of the men who are selling this material and the technique of such men as Dr. White, who told me to mix it the same as the old oxyphosphate, and keep it dry forty-five minutes, and my results have been the same. I do not think that it is a question of technique so much as a question of chemistry of the mouth. The cements do not look the same in the teeth after a year or eighteen months as they do in the boxes passed for inspection. Dr. Merritt tells us that this material is superior to porcelain inlays. I have not relegated my porcelain furnace to the ash heap, in fact I am using it as much as ever wherever it is a question of esthetics. I have stood at the chair of Dr. Head while he separated two central incisors and made two porcelain inlays in fifty-eight minutes. I am sure I could not do it in that time, but I could in an hour and a half, and then the result is infinitely superior to any of the silicate cements that any gentleman can put in.

I think the time is coming when practically all our fillings will be plastic, and I hope I will live long enough to see it, but it has not yet arrived.

In regard to pyorrhea alveolaris, I think I could do as my friend Dr. Rhein, talk about it all afternoon, although not as ably as he, and yet the topic would not be exhausted.

In regard to the bifluorid of ammonium, I stand here as one of those who have met with a failure. I am glad I mentioned this last year, because I believe it has warned many men. If Dr. Merritt can inject it in all pockets, only using warm water after it, he has my warmest admiration, because he can do what the discoverer of it himself cannot do. Dr. Head protects the gum tissues with milk of magnesia, which I am also doing now, and I have no other disaster to report.

As to the relative decay, we cannot judge it from the statistics of school children. Prophylaxis as understood today has not penetrated the schools long enough to show the proper results. We can only judge relative decay, if it is time to judge at all, from a first-class practice. Dr. D. D. Smith and many who are assembled here, who have practiced proper prophylaxis for the last six, eight, or ten years, are certainly filling less teeth today in the same mouths than they filled at previous times. It is only there that this wonderful evolution begins to show, and it will take probably one or two generations, if not more, to show this in a universal way. It cannot show proper results for comparison until

a general adoption and utilization of this method affects the people at large.

Dr. Charles Ash, Brooklyn. I was very much amazed to hear Dr. Wheeler say that the porcelain fad had come and gone. I was surprised that any man who is as capable as Dr. Wheeler could make such a statement. I was wondering afterward, in thinking it over, whether that statement was possibly made because of a fact which was brought out some years ago, and I thought I would just mention that incident. Dr. Wheeler probably remembers when he and I, a great many years ago, in New Haven, had a tilt on the question of the relative values of high and low-fusing porcelains, and he made some deductions from his use of the Jenkins porcelain which were not flattering, to say the least. When I took the floor to discuss the question, I criticized Dr. Wheeler's remarks very severely, and made the remark at that time that it seemed impossible from my point of view that those remarks could have been made by any man who had made half a dozen fillings with the Jenkins porcelain, and I was rather amused afterward to hear Dr. Wheeler admit that he had not made half a dozen fillings in his life with the Jenkins body. I think it is just possible that Dr. Wheeler has not used much of the Jenkins material, otherwise he would not have made that remark. I think the porcelain era is just in its infancy, and the more we learn about it, the more it will be used.

Dr. Merritt said, in relation to silicate cements, that the most favorable criticisms had been received, and also the most adverse reports, amounting to condemnation, and we have an illustration of it right here. We have just heard almost a condemnation of the silicate cements, and now I am prepared to hold the other side. In spite of the fact that I use a great deal of porcelain, and am delighted with its results, I use the silicate cements. I use Aschers enamel, and have had a great deal of success; but I believe the most important step in the technique of the use of Aschers enamel was overlooked by Dr. Merritt in his report. I did not realize until comparatively recently that one thing which I did was probably responsible for the success I was meeting with in the use of the enamel, and I have employed the method almost from the first. I use it in the same way as I do other fillings, namely, I line the cavity with zinc oxyphosphate, and while that is still soft and plastic, I put Aschers enamel in. I believe that is largely responsible for the success I have had.

I may also say that I have never kept the rubber dam on the teeth for twenty minutes, or even fifteen minutes after the conclusion of the polishing process. As soon as I have finished the polishing, I put the paraffin wax on, and dismiss the patient, and I can show some Aschers enamel fillings which have been in the mouth six or seven years, that are today so good that people are willing to have more such fillings inserted.

Dr. L. Meisburger. In response to Dr. Hofheinz's remarks, you will please recall that in my discussion I made reference to a well-made and well-fitting inlay, and in this connection I would ask the doctor what his opinion is of the average cast gold inlay as it presents in his office.

I have seen disfigurements caused by inlays inserted in bicuspids equally as great as those caused by the use of a gold shell. I perhaps did not make my meaning quite plain in my discussion, as I did not go into detail into the various subjects dealt with in Dr. Merritt's report.

I sometimes, especially in the case of badly broken-down molars, question if we would not make a more permanent operation by using a gold shell properly fitted, and this brings me back to the average inlay, many of which, although they do not fit accurately, are nevertheless placed in the cavity as being good enough, and that is the point upon which I wish to lay stress. That an inlay be "good enough" will not do, as that means failure from its very inception. It is this point which led me to say that I could insert the average gold filling, employing the Black method, in the same

amount of time as is consumed in making a well-fitting inlay. The saving of nerve force, as I mentioned in opening the discussion, is well worthy of consideration, both for patient and operator.

Dr. HOFHEINZ. Dr. Meisburger must not forget that we made as good gold fillings forty years ago as we do today. We have been making gold inlays only a short time. Inlays are only in their infancy; fillings were conclusive facts long ago. I do not know what Dr. Meisburger means by a large filling, unless he gives it to me in measurements. The Black fillings are almost all large. Five millimeters occluso-cervically to four millimeters bucco-lingually is a large extended cavity in a bicuspid or even a molar. I have been nursed and brought up on the system of soft gold foil for fillings of this kind, and two-thirds of all the cavities I filled were made with soft gold cylinders, finished with cohesive gold. I have no doubt that in many instances I can put in a filling of that size as readily as I can a gold inlay, but when the doctor asks me whether I consider an extensive cavity as well preserved by a crown as by a gold inlay, I say No.

Dr. MEISBURGER. I say the fillings should be perfect. I ask whether the cavities you see filled are to your satisfaction.

Dr. HOFHEINZ. When I speak of the gold inlay, I do not mean a floating island which has a millimeter of cement between the margin of the gold inlay and the margin of the cavity itself; but I mean one which fits the cavity. I have deceived some good dentists in my own office by showing them "gold inlays," that were really fillings, and more often by showing them "fillings" that were really inlays.

Perfect and imperfect are altogether relative terms, dependent upon the individual vision you put on your operations—inlays or fillings. I grant that in many instances the expert operator can put in a gold filling just as quickly as he could a gold inlay, and as far as lasting qualities are concerned, history and time have proved the value of the filling. Nothing lasts better than a well-placed gold-foil filling. There are many instances in which a filling is impracticable, as the very extreme cases that Dr. Meisburger mentioned, when it becomes a question of a crown or a gold inlay. I now hardly use a gold crown once where formerly I applied it eight or ten times. The weak walls, usually buccal and lingual, can be protected by cutting them down a millimeter or more, allowing the gold inlay to extend, and then bringing the entire occlusion to bear on the gold inlay. There will be no inflamed gum margins, such as, unless extraordinary care is used and much unnecessary time expended, present themselves more or less frequently in banded crowns.

Dr. W. A. WHITE, Phelps, N. Y. There are two phases of the questions under discussion which I wish to speak of; first, in regard to Aschers enamel. I have always been very skeptical regarding new suggestions and new materials, and always have let the other fellow try it first; but having witnessed some of the operations with Aschers enamel, I became one of its first advocates, following very closely the instructions in regard to its manipulation. I believe that in most cases failure is not due to the material, but to faulty manipulation, *i.e.* not giving the filling time to set. I have in my own mouth an Aschers enamel filling which was placed there for experiment. I had a gold filling removed four years ago, and I think you will find the Aschers enamel—which was inserted according to the instructions, ample time being given—as perfect today as it was on the day when it was put in.

In regard to the manipulation of the material, it would take too long, I think, to follow it through in detail, but I have witnessed the operations of a number of dentists, and have found in most cases that they have failed to take the proper time. I believe in time they found those fillings a failure, and they attributed it to the material, and not to their own fault.

I can show Dr. Hofheinz, or any other

dentist, some Aschers enamel fillings which have been in the mouth not quite as long as Dr. Ash has mentioned, and which are as good today as when they were put in. I saw three such fillings not less than six weeks ago, which were put in five years ago, and they are absolutely perfect today. I do not mean that every Aschers enamel filling is a success, but is there a dentist in this room who will stand up and say that every gold filling that he inserted is a success? If there is, let him stand up. I have had failures with every material I used for filling teeth; but if you will manipulate Aschers enamel according to the instructions given by the manufacturers—giving it plenty of time—you will have as great success as you would with any other material.

Dr. Hofheinz. Do you mix it according to the instructions of the manufacturer?

Dr. White. Yes, the late instructions, which are entirely different from what they used to be.

Dr. Hofheinz. They are different every six months.

Dr. White. Well, the manufacturers are becoming perfected, as we are in dentistry. They are improving on it.

My experience with porcelain inlays is limited, but I know how enthusiastic many dentists are in regard to them.

I think the subject of oral hygiene is one of the greatest before the dental profession today. Napoleon, during his reign, is said to have once asked Mme. de Staël the question: "What shall I do for the people of France?" She replied, "Educate the mothers." So I would answer the question of oral hygiene. We know very little about what to do, and if it were not for the fact of the report that will be presented during this meeting by Dr. McCall, I would like to give you some statistics regarding the great meeting held in Cleveland on March 18th; and if Dr. McCall does not present those facts, I will take pleasure in giving you a history of that meeting later.

Dr. M. L. Rhein, New York. The discussion has taken a peculiar turn, and to my mind exemplifies very forcibly what has so often been exemplified in regard to all methods of tooth preservation —it makes very little difference what the form of procedure is, the obtaining of satisfactory results rests in the amount of time and care given to each individual procedure. Most of the failures in dental operations are due primarily to the fact that either the fee that the operator can collect is insufficient to remunerate him for the necessary time, or else his own indifference to the necessity of taking sufficient time is the cause. The main reason for my discussing this report is the apparent slur that has been put on the use of porcelain, and it makes me feel that the men who take this position place themselves precisely in the attitude that I have just outlined.

In regard to the porcelain question, I still maintain my former position. I consider it one of the most valuable materials that we have, just as I consider the introduction of the silicate cements one of the most detrimental events for the practice of dentistry that has ever occurred. By that I do not mean that they have no place. They have a place, but one of such limited usefulness that when one compares their value in the hands of the intelligent operator with the untold detriment that is done to the public by their indiscriminate use, they are simply, in my opinion, a curse to the public at large.

A friend of mine in the South, to whom I have given some counsel, and whom I once advised to have filled with porcelain inlays some very apparent cavities in the anterior part of the mouth, on a visit to New York presented a most deplorable appearance, owing to silicate cement fillings. When I asked her why she had not had my advice followed out by having porcelain inserted in those places, with tears in her eyes, she said, "I went to the best dentist in my city, and told him what you said, and he told me that was a thing of the past—that they had improved on porcelain fillings, and now had a chemical porcelain that was far superior to porcelain fillings"—and this was the result!

Whether the silicate cement does last

is of no material value in my mind. I have failed to see in the best silicate cements which I have ever seen—and I have seen a great many—anything that approximates the enamel of the tooth, and the whole object in the use of these cements, or of porcelain, lies in the cosmetic and esthetic purpose. The permanent value of the porcelain inlay is the same as the permanent value of the gold inlay. If the one fails, the other will fail. In other words, under certain chemical conditions present in the mouth, the porcelain inlay ceases to be a permanent filling material; but in the case presented by Dr. White—and in cases described by so many men who delight in saying, This filling has lasted six years, or fifty years, frequently discussing a mouth in which we know there is immunity to any chemical or other disintegration of substances—any material, if placed with accuracy, will last, and be a permanent saving of the tooth during the time stated.

Consequently, in viewing the question of porcelain, we are met by the result that it has been abused in a great many cases; that is to say, it is often used in places for which it possesses too little strength. It is used in places where it has no material advantage, where, for instance, it is never apparent, and is consequently in my own judgment uncalled for. The primary value of porcelain is to prevent not only the disfiguration of the mouth, but to make it impossible for the casual observer to detect the fact that there is any filling inserted in the tooth at all; and what have we, besides porcelain properly used, that will fill its place?

I did not intend to speak upon this subject, but we, as members of the State Society, at this session have with us as our guest, and are pleased to honor the man who has given this boon not to us, but to the world that we serve—a boon that is inestimable. I have had to replace porcelain inlays in the incisors. They would not come out easily; it has taken me as much as an hour and a half to remove such a porcelain inlay in order to put a new one in, the operation being deemed necessary because the physical conditions in that patient rendered apparent the very infinitesimal line between the inlay and the enamel margin. The patients in these cases wanted to have inlays removed and similar ones replaced after the lapse of five or six years, in order that the cosmetic conditions might be kept perfect and in such a condition that there would be no appearance of anything being wrong in their teeth.

When patients are willing to do that, it is idle to say that we can relegate the porcelain furnace to the scrap-heap. The porcelain furnace—with its true value recognized by many of the profession, although it has been relegated to the scrap-heap by some—simply shares the fate of so many merited articles that are discredited by—and I say the following with the utmost candor—the incompetent man, incompetent either wilfully or ignorantly.

I have arisen only to make this plea for a material that will remain a portion of the dentist's armamentarium as long as dentistry will be practiced.

The PRESIDENT. It would seem there would be no more fitting opportunity for Dr. Jenkins to speak on this question than the present, and we should all be pleased to hear from him.

Dr. N. S. JENKINS, Paris, France. I cannot tell you how much I thank you for this kind reception, and for the graceful and kindly words which have been spoken in regard to myself; but I must say that in one respect I am but a very humble worker in this field. It was Sachs who first taught us the great advantage of the gold matrix, and upon seeing what he had accomplished with inferior material, I gave myself to the study of discovering a material which should more perfectly answer the purpose.

I wish simply to emphasize the fact that it is the use of the gold matrix which seems to me so extremely important in porcelain work. I can only give you in this short time the results of my observations, not only in Germany, but over the greater part of northern Europe as well. When men first began to be

interested in making porcelain inlays, in Germany we had to do with a peculiarly interesting class of colleagues. You must know that the German dentist is a man who has learned from the very beginning to be thorough. He has a logical mind. When he first grasps an idea, he ponders upon it, and considers it from every standpoint, and then he masters it; and the porcelain inlay in a gold matrix appealed exactly to the mind of the German dentist.

We have heard something of the disfigurement which sometimes comes from a dark line between the edge of a porcelain inlay and the enamel, and I remember reading a short time ago in the DENTAL COSMOS that it was still the *bête noire* of most operators in America. I may say that I could point to untold thousands of fillings made of porcelain, inserted by German dentists, where it is impossible to find any fine margin or any discoloration of the edge; and that comes from the fact that our German colleagues, because of their great patience and because of their entire devotion to doing things in the best possible way, have mastered the technique of porcelain inlay work, as I fear no other colleagues in the world have done.

One gentleman has spoken of the advantages of the gold inlay, in that it can be made more rapidly. This is very true in many instances, but the German dentist in general does not consider whether he is spending much or little time on a certain case. He considers whether he is doing as perfect an operation as he can perform, and if it requires two hours to do a better operation than he could do in one hour, he will take two hours for that purpose, even if he does not get an adequate fee, because he wishes to do the best he possibly can. I may say this feeling of professional responsibility is not only bred in the character of our German colleagues, but it belongs to their training.

This subject has many sides, but there is one point I wish to make in regard to the porcelain inlay which shows its great superiority over every other. Upon the insertion of a porcelain inlay, the patient is instantaneously relieved from all discomfort and annoyance. That is not so, I fear, in the insertion of a gold inlay, valuable as gold inlays are. Unhappily, in some instances, men have not taken the precaution to remove in large inlays a sufficient portion so there shall be a sufficiently large layer of cement between the pulp and the gold. That is not necessary with the porcelain inlay, it being so poor a conductor of heat that when it is once in, the patient is as newborn—the tooth is devoid of all sensitiveness.

As we have a record extending back at least twelve years of the endurance of the porcelain inlay, and as we find an inlay which has been in the mouth for eight or ten years is vastly more secure than one which has been in but six months, we may feel assured that the inlay is an enduring method of treatment.

As far as silicate cements are concerned, they undoubtedly have their place; but you may learn from the history of the silicate cements in the country in which they had their birth, this lesson: At first, they were heartily received, and silicate cement was used in a large number of cases, but little by little its use has become less popular, until now I think it is rare to find any superior German dentist who willingly inserts a silicate cement filling where it is possible to insert a porcelain inlay. If that has been the result in Germany, I think we shall probably come to a similar result throughout the world.

The advantages of the porcelain inlay are so great that we could enlarge upon them for any length of time, but we must remember that the dentist's first duty is to relieve his patient from suffering; secondly, to prevent the recurrence of disease, and thirdly, to restore to its original beauty the human face divine.

Dr. MERRITT (concluding the discussion). I want to thank those who have participated in the discussion of my report. It is impossible to embody in a report such as this opinions which will meet with the approval of all.

It has been my purpose in reviewing

the literature of the past year to give expression to what seems to have been regarded as good practice in the subjects treated. It was obviously impossible to review the whole realm of dental practice. Only a few of the newer and more debatable subjects have therefore been chosen. The older and better known methods for saving teeth have been purposely omitted.

Just why Dr. Meisburger and Dr. Wheeler—both of whom received copies of the report several weeks ago—should go out of their way to discuss the question of dental hygiene in its relation to school children, I cannot understand.

However important this subject may be, it has no place in the Report on Practice.

(To be continued.)

CONNECTICUT STATE DENTAL ASSOCIATION.

Forty-sixth Annual Convention, New Haven, Conn., April 19 and 20, 1910.

TUESDAY—*Morning Session.*

THE forty-sixth annual convention of the Connecticut State Dental Association was held in Warner Hall, New Haven, Conn., on Tuesday and Wednesday, April 19 and 20, 1910.

The first meeting was called to order on Tuesday morning at 11 o'clock by the president, Dr. Frederick W. Brown of New Haven, Conn.

The Secretary then read a communication from the National Dental Association requesting the Connecticut Society to join the National Association as a body, and that the proceedings of the society be published in the National Association journal on terms to be arranged later.

Motion was made and carried that the matter be laid on the table until a later session.

The Secretary next read a communication from Dr. Brophy with regard to the International Miller Memorial Fund.

Motion was made and carried that this also be laid on the table until a later session.

REPORT OF THE COMMITTEE ON NECROLOGY.

Dr. E. S. GAYLORD then read the report of the Committee on Necrology, as follows:

Dr. John T. Metcalf.

Dr. John T. Metcalf died at his home in Brooklyn, N. Y., October 29, 1909, aged ninety-one years.

Dr. Metcalf was born in New York city, October 17, 1818. After deciding upon his life-work, he entered the dental office of Dr. Charles Allen of New York city, remaining several years. He then removed to Nantucket, Mass., and commenced practice. In 1857, at the urgent request of President Woolsey of Yale College and others, he removed to New Haven, where he immediately established himself in a very lucrative practice. He remained in New Haven until 1869, then removed to New York to become associated in practice with his cousin, Dr. Wm. H. Allen, remaining in New York until reaching his fiftieth year in practice, when he retired. Dr. Metcalf was one of the charter members of this association, served upon the first executive committee, and was one of the early presidents of the association, retaining his membership in the society until he retired. He was the discoverer of the value of oxychlorid of zinc as a filling material for

teeth, and was the first to place it in the hands of the profession.

Dr. Metcalf was a man of rare attainments, an inborn gentleman, courteous and affable to all, and in practice excelled by few. It was always a pleasure to meet him socially and professionally; he was a fund of information, and to the time of his death retained his mental activity unimpaired. He is survived by a son, Dr. William H. Metcalf of New Haven, who is a member of this association.

Dr. E. Treat Payne.

Dr. E. Treat Payne died at his home in Darien, Conn., April 15, 1910, aged seventy-two years.

Dr. Payne was born in Prospect, Conn., September 24, 1838. His early education was received at the Seabury Academy in Cheshire, and in the Connecticut Literary Institute in Suffield. He then spent three years in mercantile pursuits, after which he entered the dental office of Dr. Asa Hill of Norwalk, remaining but one year, when he enlisted in the United States army for one year's service. At the expiration of this term of service, he took the degree of D.D.S. at Baltimore College, then opened an office in Stamford, Conn., remaining until the opportunity presented to purchase the practice of Dr. A. C. Hawes of New York city, where he met with such success as to enable him to retire from practice in 1895. He then spent five years in foreign travel, returning to open an office for the second time in Stamford. Soon, however, failing health compelled him to abandon practice. He removed to Darien, where he remained until his death. His wife survives him.

Dr. Wm. H. Loomis.

Dr. Wm. Horton Loomis died at his home at Rockville, Conn., November 7, 1909, of neuritis, in his sixty-eighth year.

[An obituary notice of Dr. Loomis having been printed in the Cosmos (see January 1910 issue) this part of the report is here omitted.]

Dr. Henry J. Stevens.

Dr. Henry J. Stevens died in New Haven, October 2, 1908, in the eightieth year of his age.

Dr. Stevens was one of the sturdy and influential men of his time. His early history we are unable to obtain. He was a resident of and conducted a successful practice in New Haven for more than fifty years. He was one of the charter members of this association, and served on its first executive committee. Later in life he became less active in society work, although maintaining his interest and continuing his practice until a few months before his death. His wife survives him.

Dr. D'Alenson Caulkins.

Dr. D'Alenson Caulkins died in New London, Conn., March 10, 1910, in the sixty-third year of his age.

Dr. Caulkins was a pupil of Dr. W. W. Sheffield, and remained with him a number of years. He then practiced his profession two years in Troy, New York, after which he returned to New London, where he practiced continuously until his death. He was a valued member of this association, a member of the New London County Dental Association, and Brainard Lodge, A. F. & A. M. His widow, daughter, father, and sister survive him.

Dr. Edward W. Pratt.

Dr. Edward W. Pratt died at his home in East Hartford, Conn., July 25, 1909, aged forty-seven years, his death resulting from an injury received in falling from a trolley car near his home.

Dr. Pratt was born in Essex, Conn., and was of the ninth generation of the family of William Pratt, who settled in Hartford in 1636. Dr. Pratt received his early education in East Hartford. At the age of fourteen he entered the South school of Hartford, which he attended for two years, and was later graduated from the Hartford public high school. He was a graduate of the Philadelphia Dental College, class of 1885. For a short time he practiced in Glastonbury, from there he removed to East Hartford, where he remained in practice until his death. He was a representative in the state legislature from East Hartford from 1897 to 1901, when he received the appointment as judge of the East Hartford court from Gov. R. S. Woodruff and was always commended by the state's attorney for his thorough service. Dr. Pratt was a mason of high degree, and also a member of the Royal Arcanum. He rendered very effective service in sustaining and amending the state dental laws, and served as dental commissioner for four years. His wife and one son, his mother and two brothers, survive him.

Respectfully submitted,

E. S. Gaylord, *Chairman,*
James McManus,
Clinton W. Strang,
J. Tenney Barker,
Louis L. Beach,
Committee.

Motion was made and carried that the report of the Committee on Necrology be received and published in the Transactions.

The next order of business was the President's address.

The vice-president, Dr. Murlless, took the chair, and Dr. BROWN delivered the annual address of the president.

The meeting was then adjourned until the afternoon session at 2 o'clock.

TUESDAY—*Afternoon Session.*

The meeting was called to order Tuesday afternoon at 2 o'clock by the president, Dr. Brown.

The first order of business was a lecture by Dr. W. A. PRICE, D.D.S., Cleveland, Ohio, on "Some Advantages of the Stone Model Method in Making Gold and Porcelain Restorations," as follows:

SOME ADVANTAGES OF THE STONE MODEL METHOD IN MAKING GOLD AND PORCELAIN RESTORATIONS.

Without spending much time on a preamble, I would ask the privilege of having an informal heart-to-heart talk with you, and wish you to ask any questions you desire, as that will help me to cover more accurately the consecutive points necessary for a general understanding of the work.

CONDITIONS CONTROLLING FILLING OPERATIONS.

I would ask you to consider first the general conditions that control our operations. We are living in the twentieth century; the dentists of the past decades have set a standard for us that forces us to strain every nerve and effort to maintain that standard, even without introducing new methods. Let us consider first these standards that we have received from the profession of the past as ideals for dental operations. When we attempt the restoration of cavities by gold inlays, we must uphold as standards the margins and contours that we have seen in probably hundreds of magnificent gold fillings malleted into place, ten, twenty, thirty, and forty years ago, and we must insist on margins as perfect as these for our gold inlays.

INTERPROXIMAL SPACES AND CONTOURS.

We have studied the interproximal spaces and have learned to recognize that a thorough restoration depends almost as much on the relationship of the teeth as on the way in which a filling fits the cavity. We must therefore emphasize contours, and must have as our ideals anatomical interproximal spaces. For that we have again to consider those beautiful malleted fillings, for they have set the highest ideal of any we have had, and in judging any specimens of inlay work, I am going to insist for myself that it comes up to those standards of margins and contours that have been furnished by the best samples of malleted gold fillings.

OBSTACLES IN THE FIELD OF OPERATION.

Another fixed condition that we want to study for a moment is the field of operation. You will all agree with me that fillings that stand as monuments to the skill of our splendid operating of the past have not always been monuments to the professional judgment of the men who inserted them, considering the strength of the patients who had to endure the insertion of such fillings. That is another standard for ideals, and we will insist on an operation that will be more comfortable for the patient, and as much more comfortable as possible than was the insertion of those large contour malleted gold fillings. I believe one of the very worthy considerations in judging the merits of any operation will be the patient's actual suffering, and also the strain on the operator, or even the inconvenience to both during the time of the insertion of a filling.

The field of operation presents very serious limitations to us. We have

learned to work in that very constricted territory, the oral cavity, with the cheek and tongue in the way, with the saliva around—and perhaps bloody saliva—so that we cannot see very well unless we put the rubber dam in position. So that is another fixed condition which we will try to modify, by removing as much of our operation as possible to a more desirable field to work in, which will be in our hands, on the table, in the laboratory, or at the bench, so as to perform, if possible, a part of the operation under more ideal conditions, always provided that the final efficiency of the operation be not sacrificed.

CONTRACTION AND EXPANSION OF METALS.

There are other fixed conditions that control very largely the success of our work, one of these being the law that controls the behavior of the metals we are working with. The profession as a whole has uncritically been taking for granted the physical processes governing the melting and cooling of gold; they are making no allowance or very little for the normal contraction that invariably takes place in gold.

There have been three distinct teachings with regard to the contraction of gold. One has been that gold does not contract if properly treated; and if it does, the contraction is so little that we may ignore it. Another is that we can prevent the contraction by a certain manipulation, which would be the chilling of the gold very quickly after casting; in other words, casting into an almost cool investment. Another has been that gold does contract a definite amount no matter when, how, or by whom it is manipulated, and that this total contraction will take place under all conditions, though its exact position may be changed in part; that is, as the mass of gold making up an inlay and sprue is cooling, the gold may be moved from the sprue to take up some of the total of the contracted gold in the inlay. In other words, it is entirely a question of position or location of the contraction that has been changed, not the total contraction, but the location of the contraction. It is very necessary for us to have something definite in our minds relative to that contraction. If, for example, gold does contract, and if we can and do not control it, making our inlays to fit a definite cavity without making allowance for that contraction, we cannot make such margins as we have taken for our ideals. It therefore becomes imperative for us to decide whether or not gold does contract, and if it does, then to make plans to provide in some way for the correction and control of that contraction. In my mind it is a fixed law and as definite a fact that gold does contract about one-fiftieth of its diameter from the crystallizing point, as is the law of gravity. No information has been published yet as to the behavior of gold as it changes its state from the liquid to the solid, though from experiments which I have made and am making, the indications are that considerable change in volume occurs then. If we cast into a piece of fused quartz, which is a substance with only about one-fortieth of the expansion and contraction of gold, the fused gold will contract normally by the simple weight of its own mass, and there will be a total contraction of over one-fiftieth of its length. The hydrostatic pressure would be sufficient to control the spheroidal tendency of the gold, for it would be at the base about 3/14 of a pound. If we were casting a bridge one inch long under these conditions, it would be over one-fiftieth of an inch shorter than the mold into which the gold was run. If, however, we will repeat that cast and have a definite and sufficient pressure on the gold at the time of cooling, we will in a measure control, not the total contraction, but the location of the contraction by forcing gold down through the sprue. We thus make our contraction take place in the sprue as much as possible, instead of having it normally distributed in the inlay and sprue. For this the investment must be hot, and the sprue gate large.

METHODS OF CONTROLLING THE CONTRACTION OF GOLD.

I do not think it necessary for me to give scientific reasons at this time for the contraction of gold, and we shall take it for granted that gold does contract. I shall now discuss the methods of controlling that contraction. It seems to be a fixed fact that the location of contraction can be controlled up to a certain point nearly in proportion to the pressure that is applied on the sprue. To be exact, if we apply a pressure of twenty-four ounces on a cross section of a sprue one-eighth of an inch square or of any globule of molten gold, it will move the gold for nearly two hundred degrees below the melting-point, which would be equivalent to an air-pressure in a casting machine of approximately one hundred and twenty pounds per square inch. If we use only two ounces, the actual pressure on that globule of gold would only move the gold for some thirty degrees below the melting-point, which would be equivalent to something like sixteen pounds per square inch—which means that the gold is contracting from the time it commences to crystallize, contracting all the time down to normal temperature at the rate of about one one-thousandth of an inch for every one hundred degrees F. in temperature. Or if in any piece contracting about one one-thousandth of its diameter for every hundred degrees F. that it cools, we only control it for two or three hundred degrees below that point, then we have nearly twenty thousandths uncontrolled. Therefore, if we are to control the contraction to a considerable degree by pressure, we must use higher pressures than are obtained in any of the small casting machines. It is possible with such a machine as I use to obtain an equivalent of as much as from three to six hundred pounds of air-pressure in casting, which, however, ordinary investments will not stand.

There are three other ways of preventing a gold inlay from being too small, viz, to prevent the contraction of the metal itself (as yet not possible), or to expand the form into which it is cast by either enlarging the pattern or the mold made from it. If we take an investing material of any of the standard formulæ and heat it, it will expand at a maximum six to eight thousandths of its dimension at a temperature of 1000° F. Therefore, if we carry out the proper manipulation, we can only hope that an ordinary investment will expand from six to eight thousandths of its diameter, leaving with ordinary low-pressure machines an uncontrolled contraction of the gold of from twelve to fourteen thousandths. The wax of which patterns or impressions are made is subject to great changes, due to treatment and temperature. If we are undertaking to make butt margins around the inlay, we will find a space even of hundredths of an inch, which is wide enough to permit perhaps twenty teams of bacteria to go in abreast. If we undertake to make a joint with that procedure, we will have a joint to be filled with cement, which, after the cement has been washed out, will provide an inviting place for bacteria.

It is not possible for us to control entirely the contraction that will take place in the gold, but we can control it in a large measure. If we use high pressure on ordinary investment materials, what happens? We find that twenty pounds of pressure from the air-machine will distort very considerably a plaster and silica mixture of one to three or one to four, so that the inlay will not go to place in the cavity. This is due to the yielding of the investing material under the pressure.

INVESTMENT MATERIALS.

This suggests another ideal, viz, to have an investment which is hard enough to withstand any pressure you desire to use, without yielding at the cavity surfaces. One of the first requisites and one of the greatest advantages of a hard model, whether it be stone or whatever you may have to cast into, is that the

surfaces reproducing the cavity will not yield under any pressure that we may apply in casting.

CAVITY PREPARATION.

Another very important phase in this work is the preparation of the cavities so as to allow us to take care of the other fixed conditions—or our inability to do two things: To control the contraction of the gold, and to put into position a block that will fit within a thousandth of an inch at all margins, if it were possible for us to make it within that proximity. It is mechanically impossible to withdraw and insert in position anything that fits as tightly as that block would, because of the necessary roughness that would occur on the surfaces. Take, for example, a glass-stoppered bottle not tapered, and try to pull that stopper from the bottle if it fits as tightly as we would want an inlay to fit if we depended on the mechanical reproduction of the margins by so exact a casting. We could not unseat an inlay if it were once in place, and we could not remove the impression, if we had the cavity so prepared, without a distortion of a few thousandths of an inch.

I believe it to be a physical impossibility to make margins with butt joints that would compare with the gold fillings that we have taken for our standard. Therefore the only way left for us to overcome this difficulty is by the preparation of the cavities. It is an axiom with me—and I believe it will be as fixed an axiom in the preparation of cavities for inlay work as is extension for prevention in the preparation for gold malleted fillings—that every margin of every surface of every cavity must be beveled, the reason being that by the burnishing of a bevel of pure gold we overcome or correct the marginal errors. It is not possible for us to spin or burnish gold up to a flat, square, open butt joint without making a depression in the surface. If, then, we have made our joint by burnishing a flap, so to speak, we must have our cavity so prepared that the burnishing will not interfere with the contours of the bevel when the operation is completed. The cervical margin should always be prepared with a bevel. A thin feather-edge margin, as we have learned, has no strength, and offers an inviting place for bacteria when opened up. The margin must invariably be chisel-shaped. With these precautions of cavity preparation and a hard model to cast directly into, and with an inlay material that can be burnished to allow of the closure of the margins, it is possible to make a restoration that in every particular will fulfil our standards, namely, margins as perfectly finished and adapted to the tooth, without a visible cement line at the edge, as our best malleted gold fillings, and contours that will not only be as good but will be very much better, because of the better conditions under which they are made, and which allow us to produce an ideal anatomical interproximal space.

THE MAKING OF AN INLAY FOR AN OCCLUSAL CAVITY IN MOLARS.

The simplest kind of cavity that we have to fill is an occlusal cavity in the molars, where there is no contour to restore, and where the contact points and both buccal and lingual walls are in position. The simplest form of tray that can be used for taking an impression of such a cavity is the finger. An impression material should be used that will reproduce the tooth perfectly. The impression material is shaped into a cone, the base of which is heated slightly so that it will stick to the finger. The tip of the cone is then heated, and the cone is put into the mouth and pressed to place in the prepared occlusal cavity. The cavity surfaces and the tooth surface beyond the cavity surface—which are required in order that in making contours we may carry out the lines of the tooth—are thus readily reproduced. This is the simplest form of restoration, and in so simple a cavity, if the point of contact with the approximating tooth is normal, the whole operation can be made readily in ten minutes by fusing the pure gold directly into the stone model. (I

will show in my clinic that this restoration can be made easily in that time, even with the inconveniences involved in a clinic.) The embarrassing part in practice will be that the operator can present to his patient the finished inlay too quickly to be able to charge a proper fee. In practice, therefore, I take the impression of the tooth, and perhaps that of one or two others, dismiss the patient, and make the inlays in the meantime, and I find that patients will pay a good fee without thinking that I am being overpaid. Still another advantage is that an assistant can make the inlay as well, perhaps, as can the operator. The filling is polished on the stone model, except the finishing of the margins, which is done after burnishing-in the soft cement in the cavity.

DIRECT VS. INDIRECT METHODS.

I should probably at this time speak more in detail of the stone model and how it is made. I am speaking this afternoon for model methods in general, and I would rather have dentists use fusible metal, sulfur, or amalgam for their models, and make the extra two steps in taking the impression and making the pattern in order to obtain more perfect contours and margins, than to have them work by the direct method, because I believe that they will get better results. By using the hard model, into which one can cast directly, two of these steps are saved, besides other advantages. The mixing of the stone is very simple. Any dentist has had practice enough in making silicate fillings to know how to manipulate that material. The stone is essentially a silicate cement, and has the additional properties that it will tolerate high temperatures without contraction and that it becomes very hard on being heated.

It would perhaps be well to trace for just a moment the steps taken and the errors introduced in the different methods. If the direct method is used, when the pattern is made directly in the cavity with wax and removed, the cavity surfaces are removed one step from the cavity. When the pattern is invested and the wax is melted out, the cavity surfaces have been removed two steps; by casting directly into the investment the cavity surfaces have been removed three steps from the original; when the fusible metal, sulfur, or amalgam model methods are used, when the impression is taken, one step is made; when that impression is placed into the modeling material, two steps are made; when an impression is made from that by making a wax pattern in the cavity, three steps; when the wax pattern is invested in the plaster and silica, four steps; and when the pattern is reproduced in gold, five steps. Yet it is better to take these five steps, if a better result can be obtained by so doing, especially in complicated cavities.

THE ARTIFICIAL STONE METHOD.

With the hard model or artificial stone method, the impression is removed from the cavity by one step; the stone model made of that impression, two steps, and the direct casting into that model, three steps, just the same as with the direct wax method. The advantages are, then, not that the steps are shortened as compared with the direct method, but that all the cavity surfaces and also the tooth surface are carried beyond the field of operation, so that, in finishing, the contours can be shaped up normally according to the ideal, the gold is being held in a solid body while the margins are being polished, and the hard surfaces of the cavity in the stone model make it possible to use as high pressure as desired.

All adjoining parts can be removed or replaced at will. Take, for example, a distal cavity in a lower second molar, where the saliva interferes and where one margin lies below the gingival line. By taking the impression the gingival tissue can be pushed down temporarily, and the margin exposed and reproduced very accurately. The third molar, after it has been reproduced on the model, can then be removed by fracturing the model, the reproduced gingival tissue can

be cut down and the cavity exposed perfectly. By putting the third molar back on the model the required contact point can be clearly noted, and no gingival tissue hinders the operator in making the contours.

TAKING IMPRESSIONS.

There have probably been few drawbacks to the inlay method that have been greater than the distortions caused from taking impressions of surfaces that are lying below an overhanging contact point. When the impression material is withdrawn from the space, the impression immediately below the contact point changes shape and is distorted at this point. If we use a tray with a septum passing down between the teeth and beyond the contact point, slowly pressing down the tissue, we not only carry the tissue down out of the way, but when the impression is withdrawn we shall have the contact point required, and the septum prevents distortion of the cervical margin of the cavity.

The first requisite for taking an impression for any method is a wax that will spread out thoroughly over the point. Another will be to have the cavity margins all beveled, so that a record of that bevel is carried away with the impression. If the cavity is prepared in that manner, and a tray of the kind referred to is employed in taking the impression, on withdrawal the cervical margin will be found undistorted. In restorations of approximal cavities, it is frequently found that at the cervical margin the butt joint is an open joint, and the inlay will not go down to place, partly owing to the contraction of the gold, partly to the distortion of the investment under the pressure used for casting. We are not able to close such cervical margins, and of all margins of a cavity none is so important. The thin vulco-carbon separating disks are very convenient for preparing the approximal and cervical margins. If the cavity is prepared with a chisel-shaped bevel at the gingival margin, the inlay can be burnished and finished and that joint closed as beautifully as in the most perfect malleted filling, provided the margin is pure gold.

One danger must be emphasized just at this point. If in making the restoration the contour has carelessly been carried too far below the gingival floor, a most embarrassing overhanging margin will result, extending into the tissue, which is possibly worse than an open butt joint. To avoid this, we make a record at the time when the impression is taken as to how far the bevel goes below that point.

THE INTERPROXIMAL SPACES.

Returning to the question of interproximal spaces, two or three important points demand consideration in reproducing an anatomically exact interproximal space. When a cavity is present in the distal surface of the second molar, the third molar is generally found tipping forward into the cavity, as the contact point is lost from the second molar, and it is almost invariably necessary, if the interproximal space is to be reproduced, to procure a little separation so as to hold the third molar in a more perfect relation. Some operators reproduce the contact point by the direct method of flowing a little extra gold at that point, and polishing this off to fit, but that is simply guesswork. A more exact method is to remove a definite amount from the reproduced contact point of the adjoining tooth and carve the wax so as to reproduce a correct interproximal space. The teeth are separated with temporary stopping.

The requisite next in importance in producing such ideals as we have set as our standards is that the material of which the inlay is made be pliable, in order that we may burnish and close the margins perfectly. Second, we must close the margin with a slow-setting cement while the cement is soft. I cannot conceive of our ideal being attained unless these two points be observed. Therefore pure gold for margins will be found very much superior to alloys, which are harder and cannot be burnished closely. A slow-setting cement will

prove to be of greater value for setting inlays than the more quickly setting cements, which harden too quickly to allow of finishing completely all margins close to the tooth before the cement is too hard.

The next class of cavities that we will consider is that in teeth in which two adjoining contact points are gone. That involves a new difficulty, because we cannot polish off a portion of the adjoining contact point. We accomplish our result as follows: We may break the model apart and put the fractured pieces together again with exactness, and make the wax patterns touch each other in that position. We have not yet allowed for any additional wax for the separation we are to get in the case. We can do this by adding wax and trying the models together. It will be found of very great advantage in such cavities to use an instrument that makes it possible to carry the two pieces of the model, after it has been fractured, directly away from each other in a parallel position, thus procuring any desired amount of separation. We accomplish that with this instrument, which is called the micrometer articulator. [The essayist here demonstrated and described the use of the instrument.]

If a series of three, four, five, or even six contact points are to be restored at once, it is done by means of that instrument so exactly that when the inlays are put into position, probably only one or two of the contact points will have to be polished off, and the occlusion is so exact that when the patient bites into the wax it will prove to be almost normal. I have no hesitation in restoring several points at once, as it can be done with exactness, provided always that the position of the teeth permits.

The next class of cavity we shall discuss is that involving two contact points on the same tooth, which will require a double tray, or one having two septa. A tray with septa of suitable length is selected, and with this an impression can be taken with great exactness of a root to be crowned or of a bicuspid or molar in which the occlusal and both the mesial and distal surfaces are to be restored by an inlay. The third molar, for example, will be taken with a box tray. The hard model holds the gold, preventing any mesio-distal shortening from contraction, which is a point of exceedingly great value.

STEPS IN CAVITY PREPARATION.

The weakest point in most of our gold inlays, if we use pure gold, lies in the step form of cavity preparation in bicuspids and molars. I wish to say in this relation that the inlay method involves no more and probably less destruction of tooth structure than does the insertion of malleted fillings, provided the malleted fillings are made with the idea of extension for prevention, for the reason that the gold can be applied in a thinner mass than in the malleted gold, and yet have strength. For the reinforcement of the step it is of great advantage to use an iridio-platinum bar, which tends to make the attachment of the gold very strong. This bar is laid into the stone model cavity before waxing up, and then the gold is cast directly around that bar, which allows a support analogous to that of reinforced concrete. The end of the iridio-platinum bar is allowed to extend beyond the tooth into the investing material.

INVESTING THE STONE MODEL.

It has just occurred to me that possibly I have not made it clear that the stone model becomes a part of the investment. After waxing up the cavity in the stone model, the sprue is attached firmly to it, and the stone model, wax filling, and all are put into the investing material, and after melting out the wax the inlay is cast in the usual way. Distortions on the occlusal surfaces may be produced by the pressure on the investing material, just as with the old methods, but no distortions of the cavity surfaces, which are the essential surfaces, will occur, these being in stone. The little tip of iridio-platinum bar extends into the investing material, which holds

it in position while the wax is being melted out.

INLAYS IN BICUSPIDS.

The preparation of cavities in bicuspids involving a contact point on the mesial or distal surface often makes it necessary to encroach upon the attachment of a good filling already in place, in order to secure a strong attachment. The ideal attachment would be to take both fillings out and make the cavity continuous from mesial to distal, but that is not necessary. If a groove and post-hole are cut, and a bent iridio-platinum bar, which comes away with the impression and is transferred to the model, is put in, waxed, and cast around, an attachment is obtained that strengthens both fillings. This is well illustrated in making an anchorage for a lower canine in which a large portion of the wall is gone. By this method of using the bar an anchorage can be secured without encroaching upon tissue that is of great value.

INLAYS IN CANINES AND INCISORS.

Probably no cavity makes greater esthetic demands upon the operator or presents greater difficulties in taking impressions than cavities in incisors and canines. There is no operation that to me is so satisfactory as a gold inlay in an anterior tooth inserted from the lingual surface. This is a very difficult operation, but it becomes relatively easy by the following procedure: The tooth is prepared from the lingual surface, and the impression is taken by the use of a septum tray, which is allowed to pass between the teeth. The impression material is put on the tray and the tray is inserted from the lingual surface. A sharp lancet or knife is used to scrape off the wax from the septum as it passes between the teeth, and also to expose very carefully the labial margins of the cavity, so that they will be reproduced in the second part of the impression. After chilling with cold water, a second mass of wax is placed against the teeth and the protruding septum from the labial surface, giving a record of the labial surface and the labial margin of the cavity. After chilling, the labial piece is removed first, then the lingual, then the two are put together, and a compound impression is obtained, so exact that when the model is made, the fillings will delight the operator if he has prepared the cavity so that the impression can be withdrawn properly. The greatest difficulty is the proper preparation of the gingival margin, the bevel of which must be carried far enough labially for the impression material to be withdrawn without distortion from the entire approximal gingival margin.

One may well ask how it is possible to make a bevel on the labial surface margin, and have it extend in such a way as to lock the filling. A filling made for that cavity according to this method will not go into place with the bevel on the labial margin as cast, until with some instrument the labial bevel is bent back sufficiently for it to pass through. When that is done, one can pass it through and by burnishing the joint can be closed. With that simple procedure, that bevel of pure gold can be turned away from the margin so as to allow the inlay to go into position, and while the cement is soft the inlay may be burnished to the cavity surfaces, and the joint be closed very perfectly, and polished like a malleted filling.

METHOD OF MODIFYING THE CONTRACTION OF GOLD.

I would say a few words on the modification of the contraction of the gold. The ideal filling material for casting would be one that would be as pliable as gold, and even stronger, and one that would not contract as much as gold. If we could modify the gold formula so as to control the contraction, it would be more valuable to us as a filling material. I do not mention this because I have succeeded, but because I want you to succeed in finding such a material. We have in Invar a metal which does

not contract or expand at the low ranges of temperature, but this is not a material which we can use for inlays. If, by adding some other metals to gold, we can produce a material that will have neither expansion nor contraction, this new alloy will be that much more valuable to us than gold. I have only to report in this connection that the addition of a little aluminum, two-tenths of one per cent., will increase the range through which the alloy will be moved by pressure several fold. This has an advantage in those cavities which are compound from mesial to distal through the occlusal. The great difficulty in filling that class of cavity consists in that the staple or horse-shoe will not go down over the tooth, and after the inlay is made it is found that it will not go to place without forcing, and the inlay on forcing simply spreads out in a V shape at the bottom. If two-tenths of one per cent. of aluminum be added, with high pressure, the total contraction can be controlled in a large measure, and if cast into a hard investment material the gold will be held so that it cannot contract. I have in my hand two rings which were cast at the same time and with the same pressure. They are reproductions of wax models that were rings of wax that passed over a tapered column of brass, and of as nearly the same size as could be made, yet one will drop over the column and the other will not go within half an inch of the bottom. One ring was cast with stone for the center, which kept it from contracting, and for the other ordinary investing material was used, the contraction of the gold compressing the investing material, therefore making the ring smaller. In inlays for the class of compound cavities referred to, the hard material will hold the gold so that it will not contract to so great an extent, if at all. In casting a base for a crown, a great advantage is also offered by using such a hard investment for the base. Many operators have cast a base for a crown, with a solid band cast for the root, and have found that it would not fit, because the contraction is so great that it will crush the investing material. If gold and platinum are used for a very heavy base, the contracting strain will be so great that even the stone is crushed, which is also true of eighteen-karat gold. A moderately sized mass of pure gold cast around that stone will not crush it, which fact suggests that we use as soft a gold as will be strong enough for casting the bases for our crowns, in order that our stone may hold it.

The effect of adding a little more aluminum to the gold is interesting and perhaps surprising. It is not desirable to use in dental work more than two-tenths of one per cent. of aluminum. If, however, ten parts of aluminum are added to ninety parts of gold, the melting-point of this alloy is lower than that of pure aluminum, also lower than that of an alloy of five parts of gold in ninety-five parts of aluminum. If two parts of aluminum and one part of gold are heated together for a long time, they will form an alloy which, though brittle and very untractable and unmoldable, has a melting-point higher than that of gold. I would not say that any union takes place between these metals, but the resultant alloy seems to represent both a chemical and a physical union, and has properties and a melting-point entirely out of proportion to the physical properties of the metals individually. It is a difficult alloy to form, and seems to have the formula $AuAl_2$.

RESTORATION OF INCISAL ANGLES.

I have not spoken of the details of making a restoration of incisal angles with compound fillings of gold and porcelain. Few operations can be so successfully accomplished as the restoration of these angles by casting a window-faced gold and platinum inlay and fusing porcelain into that, or better, cementing the porcelain, giving the esthetic effect of an all-porcelain inlay and the strength of a gold and platinum inlay.

I wish to thank you for your attention. I have been as brief as was possible in the presentation of this subject.

Discussion.

Dr. G. B. Palmer, New York. I am very glad of the opportunity to say a word of this method of Dr. Price's, for I have been using it now since November and have been very successful with it. I saw him in Brooklyn last fall, when I extended to him an invitation to present his work before this meeting of our society. I had some trouble at first in working that method, but Dr. Price kindly helped me over my difficulties, and since that time I have given up the idea of the direct method, and have had only two failures since. I have made a great many inlays after his plan, and find it of great advantage in very many cases, notably when we wish to anchor a base. There are very many cases in which we have occasion to put a band over the occlusal surface, with a post in the root-canal. By this method the post is fitted into the cavity, an impression in wax is taken and withdrawn and the stone model is made. The band and pin remain on the model in the exact position in which they are removed from the cavity, and the gold is cast directly around that. This process is always successful—the inlay will readily go into the cavity, and the post will take its proper position.

Another very important feature is the restoring of contact points. The model can be broken; if, for instance, a cavity involves the mesial, distal, and occlusal surfaces, the inlay can be waxed directly to the model and cast so accurately that it fits within a thousandth of an inch every time. The inlay can be finished and polished so that when it is set into the cavity, no further work on it will be needed. The adoption of this method will surely be found very satisfactory.

Dr. James McManus, on behalf of the members of the society, presented the president, Dr. Brown, with a gavel to be used in the conduct of the society proceedings, and as a memento of his tenure of office as president.

The meeting then adjourned until the evening session at 8 o'clock.

Tuesday—*Evening Session.*

The session was called to order Tuesday evening at 8 o'clock by the president, Dr. Brown.

The first order of business for the evening session was the reading of a paper by Dr. Thomas E. Weeks, Philadelphia, Pa., entitled "The Care of the Teeth of Children: Our Duty to the Men and Women of the Future."

[This paper is printed in full at page 738 of the July issue of the Cosmos.]

Discussion.

Dr. A. J. Flanagan, Springfield, Mass. It seems like the old times of the years gone by to have a man journey from the Philadelphia Dental College and come to New England and address us. If we go back in the history of dentistry it will be interesting and entertaining to find that way back in 1865 we had Garretson, we had Flagg, and later we had Stellwagen and Guilford come to New England and visit the various dental societies. In those days it was rather a rare occasion when we did not have a yearly visit from some representative of the old Philadelphia Dental College to give us the advanced, the new in dentistry. It is rather pleasing to record the fact that we have tonight a dental teacher from the middle west, who now makes his home in Philadelphia, and comes to us under the flag of the old Philadelphia Dental College to address us. May he have success in the East, as he has had in the West.

I was rather pleased when our friend Dr. Weeks said that God willed that people should owe us something. I did not have to go to the Bible to discover that, because I have been in practice now for twenty years.

Dr. Weeks has taken a broad stand on the question of the treatment of the teeth of children, and especially on the question of charitable work. Perhaps I had better confess than brag that for seven years I was attending dentist at a charitable institution in Springfield; for more than twelve years I have been den-

tal surgeon on a hospital staff, so that I have had what might be termed, perhaps not a scientific education, but practical experience, along these lines. This question of the charitable work of dentists as judged in comparison with that of physicians needs a little new understanding. Take, for instance, this city or any city, where medical men are doing charitable work—what does that work usually consist of? I am going to advance an opinion, after twelve years of experience, and that is this: The average physician, if he is in attendance at a medical hospital or in charitable institutions—what sort of work does he do, and how much time does he devote to it? That is what we must consider when we compare the charitable work of the dentist with that of the medical man. The medical man, after his regular office hours, which are usually from eight to nine in the morning, two to four in the afternoon, and sometimes from seven to eight in the evening, has his driver come to the door and is carried to the hospital where he may have in charge a dozen patients as medical adviser—and what does that really mean? He goes to the various wards—there is a house surgeon, there are assistants and nurses —and visits the twelve patients, which often does not take an hour. He leaves directions, if a wound needs cleansing or if the patient needs new medicine; he does not stop to do that himself, for his assistants can attend to all that. This has not taken one hour of his time, and yet we find the medical men rising up in their might and demanding that we dentists do something along similar lines.

Suppose a dentist spends an hour in charitable work, what does he accomplish? His work is entirely different; it does not consist in giving nurses and assistants directions to do so-and-so; the dentist must do the work himself, and by an hour of charitable work in dentistry but little can be accomplished. Yet, if a dental practitioner gives one-half day in a month for thorough dental service, he is doing more work and giving more in real service than the average medical man is during an attendance of one month in the average hospital.

Take the surgeon; what does his work consist of? If his patient is a public patient and comes into the public ward, he does not prepare the patient for the operation, give the anesthetic, or attend to the requirements after the operation; his assistant or assistants can do all that. He may take from a quarter to a half-hour to perform his operation—indeed, in a month many a prominent surgeon in New York city does not give six hours of actual service; and yet unfair comparisons are made. If a dentist gives an hour's time, nothing is thought of it, and no recognition is given for his work. On the other hand, patients are sent to the hospitals as charitable patients at a minimum charge of seven to ten dollars a week, but at times a surgeon who has charged no fee for the operation because he was on service at the time, receives a recompense on the quiet afterward because of special attention, while the hospital receives only its regular weekly rate. How about those medical and surgical cases in which the physician is called to the home of the sick and recommends the hospital because the patient has not the means to pay him for home treatment? There is an unwritten history of philanthropic and charitable work in so-called hospitals and dispensaries which the public in general, and the dental profession in particular, need to peruse.

There is a condition, gentlemen, which should be explained more fully than it has been. If a dental dispensary is expected to do its best work, there must be at least one dentist there in regular daily attendance, similar to the service of an interne. Very little truly practical work can be accomplished without plenty of time and much brain work, backed by all that finger ability means, for in dentistry you can accomplish little by writing prescriptions.

In regard to the treatment of children's teeth, I was hoping that Dr. Weeks would speak of the use of silver nitrate, especially in the treatment of

superficial caries in deciduous teeth, also of the use of gutta-percha. To be sure he mentioned base-plate gutta-percha, but not as I wished him to. I was brought up under the care and tuition of Dr. Flagg, and perhaps I am a gutta-percha enthusiast. I consider it of prime importance to educate parents to the fact that the eight molars of the deciduous set should be saved. The reason should be explained to them why these teeth are so important in the period of from eight to ten years of age, and why they, above all others, should be preserved. If a child of poor parentage at the age of four or five has an anterior tooth decaying, which we know is going to be lost at the age of six or seven, why torture the child by putting in cement fillings, when we can use silver nitrate; and why not do as the physician does, charge for the advice as well as the service? It is astonishing to find good dentists giving hours of service in advice, and applying treatments, and getting not one cent for it. Would the physician render these services gratis?—yet we claim to be a branch of the healing art.

If the proper education had been given to the public by the dental profession in the past relative to dental advice, the general thought would not prevail at the present time that a dentist can charge a fee only for material service. We are to blame for these conditions.

The essayist speaks of the question of cement, and I am willing to admit that there is not much sense in using cement oxyphosphates in children's teeth. We frequently find, if there is a cavity in the first deciduous molar, that there is one in the second also, and what is to prevent us from making of these two cavities one simple cavity? The S. S. White Co. has had for years what they call a space-guard, to be used in making one simple cavity of these approximal cavities in deciduous molars. It consists of a little piece of tin covered with base-plate gutta-percha, one side of which is warmed; then the piece is forced to the bottom of the cavity, thus making a bridge over the septum of the gum between the deciduous molars. On this bridge of tin and gutta-percha you can build a filling of gutta-percha, cement, or amalgam. No one greater aid has been given to us in recent years than this space-guard in the saving of deciduous teeth with comfort to the patient and satisfaction to the dentist.

I agree with the essayist in his conception of the use of metals in deciduous teeth because of conditions we cannot control. The main object is to give service free of pain, and which will give comfort for the longest time. I have found nothing that exceeds in good qualities ordinary base-plate gutta-percha. Someone may say that it wears out from attrition. True, but what is to prevent us from covering the gutta-percha with a small piece of gold, or some baser metal, to which a small headed pin has been soldered. This cover can be slightly warmed and pressed into the body of gutta-percha, thus constituting a metal covering or inlay over the gutta-percha. There is far too much neglect of children's teeth, because the average dental practitioner has not educated the parents to a proper and just estimate of the deciduous teeth. This education means also a proper recompense for prevention and treatment, rather than for operative work. Parents usually understand that a physician charges the same fee for relief of suffering in a child as in an adult. Why should dentists charge less, or dismiss the little patient with makeshift temporary relief? After our little patient has gone from the office we expect the Almighty to be kind to that child, but in any event another dentist will be.

I find that the greatest help in handling children consists in having the armamentarium ready. I doubt if anyone who treats children can retain a successful practice if he uses the rubber dam indiscriminately on children's teeth. We have any number of napkins and cotton rolls to be used in place of the dam, also special clamps and matrices, saliva ejectors and compressed air, all of which are helps in treating children that we did not have years ago.

The essayist spoke of calling in the unethical and unrecognized dental prac-

titioners to fill positions in dispensaries and institutions. Does the essayist believe it to be proper to fill positions with the unethical? Again, can a dental practitioner be truly ethical who holds no membership or interest in any dental or medical society? One of the things that boom medical societies today is the fact that practically no medical practitioner can hope for preferment or appointment without membership in at least his local or state society. I doubt if it would be possible in New England today to have a medical inspector or examiner appointed to any position of trust or preferment of a public or private nature, unless he were a member in good standing of his state or district society. If a practitioner is appointed to a position in a hospital, the first requirement is that he must be a member in good standing, and if he is not, he cannot get on the staff. It behooves us to remember these facts, and the principles that build up a profession are as necessary in dentistry as they are in medicine or in any other profession.

In closing, I wish to say that in discussing the question of comparison of the worth and appreciation of the medical and dental professions, we should assume a just and intelligent standpoint. By knowing general conditions, and informing the public of the relative value of medicine and dentistry under these conditions, we will soon have a standing in the minds of the public on a level equal to that accorded to medicine at the present time.

Dr. L. C. Taylor, Hartford. This subject is very dear to my heart. That we have listened to a most excellent paper this evening no one can deny. I agree with the essayist in every point but one in the matter of education. The spirit and intent of the paper is most excellent, and I wish to congratulate the essayist especially in that he has not spoken altogether, as most men do, about wanting to examine the "teeth" of the children in the public schools. That term used alone casts a suspicion upon the man who makes it. When you say you wish to examine the mouth—instead of merely the teeth—of a patient with a view to seeing what exists there, you show that you comprehend something, for that the jaws and the soft tissues and the alveolar borders are of as much importance as the teeth themselves, no one can deny, because they help to make up the character and quality of the child. We have lived too long in the land of tooth-carpenters; there is still too much extracting. A few days ago the Stomatological Society of New York passed resolutions condemning almost *in toto* the extraction of teeth in children under sixteen years of age. The practitioner who extracts a tooth simply because it is easier to do so than to care for it, is injuring the child, and not doing justice to his patient.

Our essayist speaks of the majority. The majority are the poor children whom he wishes to have cared for. That is a great work, a work we should all be interested in, because in time to come we can stamp out the teachings of the past forty years, when extracting teeth was the main feature of professional work. It is time to wake up, time to progress.

The essayist speaks of how he handles children and how he declines to allow the mother to be present with the child. I would take exception to that. If he will allow the mother to come with the child and will give her a lecture while he is working for it, he will get the finest control of the child possible to obtain. Moreover, when he has finished, he has probably converted the mother to recognize the necessity of caring for the mouth, and she will probably bring the child again.

Dr. Weeks speaks of the care of the teeth of children as the discharge of our duty to the men and women of the future. Our duty, of course, is to care for them as best we can, but let us teach so that we can obtain control and carry them along when they become men and women. I want control of the children, but I also want the mothers who stand behind them.

Next the essayist spoke of disease of the mouth and teeth and its importance. This is a great field, because diseases

that pertain to the mouth are most prevalent, and may be treated with the greatest benefit to the patient. I can name no less than twelve or fourteen patients who have told me frankly that I have cured their rheumatism, because it was oral conditions that had caused the disease. The toxic products in the mouth become so abnormal that the organs of the body decline to take care of them, and they are left to circulate in the system, making the patient believe that he has rheumatism. I explain to the patients that after the cause has been removed, the stomach tones up, the skin becomes normal, the poisons are eliminated, and the rheumatism is cured. That is only one of the phases of the importance of dental care, as the number of diseases and dangers that come from unhygienic mouth conditions is very great. I therefore claim that our principal duty consists in caring for the diseases of the mouth, which is paramount to the filling of teeth.

The essayist speaks of teaching and preaching. That is a right and proper statement. We should do something besides looking for simple cavities, which seems to be the principal object of many practitioners. There is more dental work being neglected today than is being done, which is a point that many have paid very little attention to.

With regard to the question of necessary instruction in the public schools, I would say that the children should in school learn something besides studying music, or this or that art; they must be taught to appreciate clean mouths. Some say that they cannot understand this. Children understand more than they are credited with, and sometimes they grasp these points to a fuller extent and much more quickly than older persons.

The essayist speaks of the use of copper oxyphosphate as a filling material. I do not believe that copper oxyphosphate should be introduced into the mouth of a child, because equally as good results can be obtained by simply painting over the cavity with resin. By making a film of resin over the bottom of the cavity to protect the pulp from irritation and subsequent trouble, oxyphosphate can be inserted, and a gold or an amalgam filling built into it while it is still soft, yielding a good permanent filling for the child at eight years of age that will be of long duration if it is fairly well done, this method being applicable in almost all cases.

Dr. W. A. Price, Cleveland, Ohio. Someone asked me this afternoon if I would not say something of the work we have been doing in Cleveland for the care of children's teeth. I want to say to Dr. Taylor that in Cleveland all children have to go to school, so that in order to reach the children we have to go to the schools, but we do not simply examine but repair their teeth.

Dr. Taylor. Do you examine their mouths well?

Dr. Price. We examine them well, and the gum tissues and the oral conditions are noted as carefully as the cavity conditions. Our plan of work is based on the following considerations: We take it for granted that every child's teeth and oral conditions should be taken care of. We have some eighty or ninety dentists in Cleveland, all members of our city society, who have agreed to give a week of their time or thirty-three dollars in money for the care of the teeth of the children of people who cannot afford to pay for the work. While we incidentally examine their mouths in the schools, we send the examination card to their parents with the statement that if they cannot afford to have their children's mouths put in good condition, we will do it. We have in conjunction with that work twenty lecturers, divided into four groups of five men, each group giving a lecture on one branch, making four separate lectures. Each lecture is given with the aid of a lantern, and each one takes fifteen minutes. In this way we put before an audience in an hour enough to make them think for some time, and I wish to say that the results of our work have been very gratifying indeed. No phase of our work is more important than the care of the children's teeth, which Dr. Weeks has so strongly emphasized.

How many realize that of the children growing up today probably fifty per cent. of the boys would not be accepted in the United States army, because they have not teeth good enough for such service. When a nation like Germany has seized the opportunity of rendering more men capable of military service by the establishment of fifty clinics, and by making it compulsory for the people to have their teeth taken care of, it is an object lesson to us.

There is another matter that I wish to speak of in this connection. If you go to the museum at Colorado Springs, you will find that in all the cliff-dwellers' skulls on exhibition there none of the deciduous teeth exhibit any caries. You may find a tooth broken off from a blow, but you will not find any caries. If you visit communities of Italy, where the people are largely engaged in out-of-door work and live on coarse foods, you find the deciduous teeth of the children beautifully developed, with strong enamel. Why is this? If you examine in a community such as your city or mine the teeth of children of parents of modern civilization, you will find that their deciduous teeth are chalky. I want to say from what study I have given to this subject that a great deal of damage is done in this direction by the teaching of "tocology," which has for its basic idea the regulation of the mother's diet during the period of pregnancy, with a view of developing a small osseous frame in the child for the comfort of the mother at the birth of the child. In the effort to produce small bones the child is starved of the calcium salts that make good teeth. We can trace defective teeth directly to the lack of nourishment of the child during its early life, the food being such as not to induce the proper formation of the teeth. I wish to ask how many mothers know of the necessity of feeding a child such food as will produce good teeth. To my mind this is one of the most important duties that we have for the future, *i.e.* to combat this fearful doctrine of tocology, and establish an understanding among people of all grades of society that they cannot afford to starve children before birth, for they are taking away from them that which is most necessary for their service in life as citizens; and we must of necessity go into the schools and teach what foods children should have during the first four years of their lives. I have models of a number of cases; in one of these there are three children in the family, and the teeth of the first two were so poor that it seemed impossible to keep the deciduous set in the mouth for the normal length of time. The mother is an acknowledged student and advocate of the doctrine of tocology. The third child, however, was brought up under different conditions. After the third month of pregnancy the mother started the diet for the formation of splendid teeth for the baby, with the result that the deciduous teeth erupted as though they belonged to one of those cliff-dwellers, so perfectly were they formed, and such hard enamel they had. A correct system of feeding was carried on just as assiduously during the first four or five years, and the child's permanent teeth are now erupting with no cavities and with the enamel beautifully formed. There was no other reason for this child's having better teeth than the others than the better treatment which it received in the matter of diet. Is that not a sufficient warrant, if we wish to do our duty to the men and women of the future, to go before our communities and implore them, if not demand, that they take more care of the diet of the mother before the birth of children, and of the food of the children after birth?

Dr. F. T. Murlless, Jr., Hartford. This is a matter concerning which I feel a great deal of enthusiasm. I have had occasion to take some special interest in it of late, and I am thoroughly impressed with the pathetic need of active efforts. In fact the need is so stupendous and the difficulties are so great that the situation is almost depressing. You will share my feelings when I tell you that one of the commissioners of public health of Chicago reported recently that in the public schools of that city, not-

withstanding a rigid process of isolation, disinfection, and inspection of scarlatina cases, the readmission of these patients was almost uniformly followed by a fresh outbreak of scarlatina in the schoolroom to which they returned. This fact attracted so much attention that medical inspectors went over the cases again to see why this occurred, but were inclined to regard the recurrence of the disease as merely a matter of coincidence. When cultures were made from cavities in the teeth of these children it was discovered that for a considerable period after the child had returned to school there were germs of scarlatina in these cavities, and that fellow scholars were being infected through the common use of drinking-cups, lead pencils, and books. Therefore since we know the remedy, it is for us to apply it. Without doubt this terrible scourge could be stamped out but for oral incubation of the bacillus. To do this every child must have not *post facto* but prophylactic dental attention. There are many details that we shall have to work out in regard to administration before much alteration can be made in the situation. It is a question in my mind whether here in the East, in most communities, we can at present have oral examinations enforced as they have in Cleveland. The people in our staid conservative New England states are a little averse to examination of their children's teeth in schools. I believe a beginning may be made by limiting our attentions at first to the teeth of the children of the deserving poor. In speaking with one of the principals of a public school in one of our large cities, I found that in a city of eighty thousand people it was estimated that they had fourteen thousand school children. According to the statistics which are furnished by the examination of millions of children, it is safe to say that ninety per cent. of them are in need of immediate oral attention. I asked how many in this city were children of the deserving poor, and my informant said, "Well, you can say that ten per cent. of this ninety per cent. especially deserve consideration." Among these fourteen thousand then we have fourteen hundred who cannot pay for necessary dental service. That is comparatively few, but when we think of the aggregate amount of hours of work required to give even these fourteen hundred children comfort and protection, we have a stupendous proposition before us.

A way to get at these deserving children, I might suggest, would be by means of a blank to be filled out by the school principal or the mother superior, recommending the child and giving enough of the facts in regard to the family so that the case could be traced, which would seem to me to be quite essential. There is another feature of this work that is going to be very difficult to handle at first, namely, its financial aspect. Until, through active work, the people of a community are able to appreciate how directly dental attention affects the health of the child, appropriations of public money will be difficult to secure, but if started with private contributions and voluntary dental attendance, this movement will soon secure recognition, and become a part of the municipal machinery of every city and town.

Dr. Weeks (closing the discussion). I would like to ask every man present to read the paper when it is published thoughtfully and carefully, and try to see what was in my mind when I wrote it.

When we are called upon to go to war, we do not stop to ask what religion, cult, or grade of society a man belongs to before we allow him to go into the army and fight. Let us get over this narrowness and give every fellow, no matter whether he is in our association or not, a chance to do his duty. That is all I ask you to do. It will broaden you; it will broaden him, and it will bring him into the society in spite of everything.

I brought out one method of treating children's teeth for two reasons. First, I have used that method over twenty years, and I have seen the teeth of children improve under it. I have had experience in treating the mouths of young girls of seventeen or eighteen years of age, in whom the teeth of one side were

kept filled with copper oxyphosphate from an early age, while those of the other side presented fresh cavities in which the difference in the character of the teeth of the two sides was very marked. Moreover, I am sure that the majority of men within hearing distance of me have not had so much experience with this material.

In regard to Dr. Flanagan's remarks on the question of medical societies, let me say that you must keep in mind the fact that nearly every young man entering that profession thinks it is his duty to join a society. Do the dental graduates think so? Not at all.

Dr. FLANAGAN. Who is to blame?

Dr. WEEKS. We are. My suggestion was offered not in the spirit of blame, but was meant to help you to bring about that which you wish.

Regarding the choice of material for teeth of children, do not overlook the antiseptic and therapeutic properties of the materials that go into a cavity. I agree most heartily with Dr. Taylor that cavities are only an incident in mouth conditions, and it is the condition of the whole mouth that we as dental physicians should look after.

It has been said by Dr. Flanagan that we are limited in the amount of service. Like him, I am going to confess and not brag. Our good friend, Dr. Tracy, with some others, has charge of a dental clinic in New York connected with one of the hospitals, and while I was in New York one winter I volunteered to help out a little. There was a trained nurse in attendance who assisted the operators and kept the records. She reported that the average for each one of the several afternoons that I served was fourteen children treated and twenty-six fillings made. I am no smarter than a great many others, but that is a lot of work to do in an afternoon. Yet it can be easily done if you have a trained assistant and follow the methods and use the materials suggested.

In closing, I wish to say that there are wonderful possibilities in this line of work, if you will all become as enthusiastic as many are. If you will, the ways and means will work out naturally.

The meeting then adjourned until Wednesday morning at 10 o'clock.

(To be continued.)

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PHILADELPHIA, SEPTEMBER 1910.

EDITORIAL DEPARTMENT.

DENTAL MECHANICS AS A PROBLEM IN THE CURRICULUM.

AT its recent meeting in Liverpool an able paper upon the above topic was read before the British Dental Association by Mr. W. H. Gilmour, M.D.S.Liv., L.D.S.Eng., warden of the Dental Hospital at Liverpool. The paper is both interesting and important, first because of the strong reasoning which it embodies with regard to the importance of a thorough training in mechanical technique as a part of the dental curriculum, and secondly because it is a demonstration of the fact that those of our English colleagues who are practically engaged in the work of educating dental students are questioning the merits of the apprenticeship method of training dental students in the technique of mechanical dentistry. It has, indeed, long been a subject of wonder why the apprenticeship system as a method of securing a training in dental mechanics should have survived with such vital tenacity in England, when both on *a priori* grounds and as the result of many

years of practical test it appears that a systematic and graded course of instruction in this essential qualification for successful practice furnishes the best and fullest training in a given time.

It is freely admitted that, given a skilled and conscientious practitioner with the gift of teaching well developed, and a pupil of unusual natural ability and aptitude, there is no reason to doubt that the apprenticeship system would produce excellent results. But while that is true, these are extraordinary conditions, ideal in fact, and so unusual as to constitute infrequent exceptions to the general rule that practitioners on the whole are not teachers, and that pupils on the whole are not gifted with such special ability or aptitude. It is probably true that the brilliant examples which the history of our profession records of men trained under the apprenticeship system are mainly instances of the fortuitous combination of the ideal master and the exceptional pupil—whose later attainments and example as a practitioner have served to magnify the value of the system under which he was trained. Of these cases we hear much, for, being conspicuous by their excellence, they naturally attract attention and excite interest. On the other hand, we know little or nothing of the failures, the weaklings and incompetents, which the apprenticeship system has produced; consequently we have been inclined to measure the system by its comparatively few excellent results, and to thus unduly magnify its value.

While the apprenticeship system as such has long ceased to exist in America, there still remains in the minds of many practitioners the belief that it possesses superior advantages to the systematic laboratory training of the dental school curriculum. Those holding administrative relations to our dental schools are constantly confronted with the suggestion by intending matriculants that it would perhaps be well to spend a year or so in the laboratory or office of a practitioner before entering upon the dental school course; or its counterpart advice from the private preceptor to his pupil, to "learn his theory at college and his practical work in his preceptor's office." Both of these suggestions are a reflex of the belief that the private preceptorship plan, or the apprenticeship system, has superior advantages to the dental school curriculum as a method of practical training in operative and mechanical technique. It is this same erroneous notion in another

form which has embodied in a few of our state dental laws the provision that the candidate for license may secure the right to practice simply by passing the examination of the state board, irrespective of whether he has had the discipline of a dental school training or not. It is conceivable, of course, that occasionally a specially endowed genius may by self-culture attain that degree of knowledge and skill which will enable him to compare favorably in educational results with the dental school graduate; but, again, these are the infrequent exceptions. The dental law must deal with the average case just as the dental school deals with the average case, and as these form the great bulk of student material from which the professional ranks are recruited, a system of training which experience shows to be best adapted to the student of average intelligence is the one which will most certainly protect the public from the ill results of incompetent dental service. Mr. Gilmour frankly states the results of his own observation in testing the qualifications of pupils trained in dental mechanics under the apprenticeship system in England, where it is still the recognized method. He says, "In nearly all dental schools there is a test examination in dental mechanics early in the career of the student, at which most of the results obtained would astonish the private practitioner; excellent results are occasionally seen, but these are usually shown by men of long experience in a workshop, or by those of exceptional natural ability, and it would seem to be a question of sheer luck as to who trained them. Even with the best, it is rare to find a pupil who has a practical knowledge of all branches of dental mechanics, and rare even to find those who have a theoretical knowledge of all the various methods. I do not say that it is impossible to obtain excellent training with a private practitioner, but I do say the odds are very much against it."

It is an encouraging and hopeful sign that such an outspoken and candid statement of fact with regard to the defective character of the apprenticeship system as a whole could be given the sympathetic hearing which it received from the British Dental Association. It is high time that we should realize the fundamental truth that teaching is an art with a scientific foundation; that to know a thing does not by any means imply the ability to teach it. Teaching is a profession in itself that requires a special train-

ing of naturally endowed mental and psychic faculties, and in connection with dentistry, as in the case of all technical pursuits, the data which comprise its art and science have accumulated to such a degree that the old empirical methods of teaching are no longer capable of dealing with the mass of material involved. Organization and system in the arrangement and presentation of data are essential in order that they may be set before the mind of the student in such a way that they may be understood and assimilated, and this can only be accomplished by the methods and facilities of a properly conducted dental school. We must get rid of the notion that every dentist because he may be intelligent or skilful is therefore a teacher, and above all we must get rid of the idea of "master" and "apprentice" in connection with dental mechanics. This latter relic of barbarism has clung like Sindbad's Old Man of the Sea to the neck of dental art, degraded it to the level of a handicraft and prevented it from taking its place as a fine art. It is the difference between the performance of the virtuoso and the pianola.

Corrigenda.

By an oversight we failed at the time to note the fact that the report of the Paris meeting of the American Dental Society of Europe which appeared in our July issue was translated from Dr. Hirschfeld's French *résumé* in an advance copy of *L'Odontologie* furnished to us by courtesy of the editorial staff of that journal.

* * *

It should be stated that the method of injection treated of and illustrated by Dr. Benjamin H. Masselink in his article entitled "The Advent of Painless Dentistry," published in our August issue (page 868), is known as "Otte's intra-osseous injection." The solution employed (page 870) is that of Dr. Guido Fischer of the Dental Department of Greifswald University, Germany; its formula was also given in our Review of Current Dental Literature, November 1909, page 1342.

Review of Current Dental Literature.

[*Proceedings of the Royal Society of Medicine*, London, March 1910.]

A STERILIZABLE FILM-HOLDER. By C. A. Clark, L.D.S.

A simple device for holding films in the mouth for X-ray work has long been necessary. There are many ways of holding the film; the patient may hold it in position with his fingers or, in case of children, one of the parents or relations accompanying the child may hold it, which is not an altogether reliable way; or a German silver plate may be struck up, which is, however, bulky, and for that reason inconvenient to the patient. One of the best ways, no doubt, is to have the film held by an experienced and reliable assistant, but owing to the risk of dermatitis or of burning the hand, this method is to be avoided. The author has therefore undertaken to modify an ingenious device of German design, which had the serious drawback of being unsterilizable and very bulky. This device for the lower bicuspid and molar region consists of a piece of hard wood, easily penetrated by the rays, about one-third of an inch wide, and wedge-shaped. This is attached by screws to a piece of pewter bent at right angles, and at the angle there is a space of about one-eighth of an inch. In this space is placed the film, previously wrapped in black paper and gutta-percha tissue, and by pinching the holder a little, it is possible to hold the film quite firmly. It was found, however, that the holder when bitten upon would sometimes tip up, and so not keep the film close to the gum. To prevent this, Mr. Clark had an extension made so that it should be possible for the patient to bite on it on the other side of the mouth, and so force the holder close to the gum. The holders for the lower incisor or canine region do not require this extension. In the holders for the maxilla the pewter is more curved, to better fit the palate; this metal is soft enough to be bent easily for any particular case. For the upper front teeth an extension of metal backward is to be added, owing to the fact that the lower teeth do not come sufficiently forward when biting on an object. This also has the effect of pushing the film close to the gum. These holders have been very successful, enabling the operator to obtain very sharp radiographs. At first these holders were made of lead, but as it was impossible to make them look well, pewter was used, which is soft enough to be bent to any desirable shape, and prevents the electrolytic action of the X rays on the plate or film, which takes place unless the latter are backed by metal. To sterilize these holders it is only necessary to boil them for not less than half an hour. Tests were made by the author to ascertain whether the wood portion of these holders would be rendered sterile by boiling half an hour, which yielded entirely satisfactory results.

[*Correspondenzblatt fuer Zahnaerzte*, Berlin, April 1910.]

A COLLARLESS PIVOT TOOTH. By Professor Wilhelm Sachs, Berlin.

After enumerating some of the various kinds of pivot teeth which have been constructed during about one hundred years, and briefly indicating their shortcomings, which are known to every practitioner (incomplete protection against caries, danger of splitting the root, destruction of the circular ligament, lack of perfect fit, and in Richmond crowns visibility of the gold collar), the author presents a method for central incisors, canines, and bicuspids, which has been rendered practicable by the invention of the casting process, and which offers reasonable certainty for the non-recurrence of caries. In roots which are to be employed as abutments in bridge work, the author, however, still adheres to the banded crown, owing to the strong force of leverage brought to bear upon such an abutment, also in upper laterals and in the four lower incisors. In single central incisors, canines, and bicuspids, however, the collar-

less pivot tooth is employed after the following method:

In a central incisor, for instance, the root is ground smooth to the level of the gingiva, and the labial edge is beveled somewhat below the gum. The enamel edges of the root are not removed as in the preparation for a banded crown. The apical foramen of the root is sealed with a suitable filling. A simple porcelain facing with parallel pins is ground so that its lower edge just touches the labial edge of the root. An iridio-platinum post of about 1.5 to 1.7 mm. thickness and from 6 to 7 mm. length, and having a knee-shaped bend, is fitted into the root-canal. This post must be made of one piece—never soldered, as the greatest strain is brought to bear upon the knee. Prior to its insertion the canal has been reamed out with a reamer of corresponding size, an enlargement about 2 mm. in depth being also made of the root-canal on the lingual side for the reception of the knee-shaped portion of the post. This form of preparation offers the following advantages: The root portion of the post will not revolve on its own axis, as it is firmly embedded in the depression made for the knee-joint. The protruding portion does not interfere with the fitting of the porcelain facing, and need not be filed off on the labial side as in case of a straight post, nor need the porcelain facing be weakened by a groove ground between the pins in order to adjust it in a proper position. After the preparation of the root and the insertion of the post in the root-canal, an impression is taken, and the porcelain facing is fitted accurately to the model, which then contains the post. On this model the post and facing are fastened together by means of sticky-wax such as is employed in gold inlays, and the lingual side of the crown is carved in wax, after the pins have been bent with flat pliers tightly around the post. In cases of short bite the post may have to be shortened so that the bending of the pins around the post is impossible. In any event, the post should be roughened in order to increase the adherence of the wax. The whole crown is then removed from the model, a small additional drop of wax is added to the basal surface of the crown, and the whole pressed upon the root with moderately strong pressure while the drop of wax is still soft. The wax is cooled with a stream of cold water, any protruding portion of it is removed, and all details of contour and articulation are carefully attended to. (See Fig. 1.) The crown is then invested, and the wax replaced with gold cast after any one of the approved methods. After trimming and polishing, the crown is sealed in the root with thinly mixed cement or soft gutta-percha.

Fig. 1.

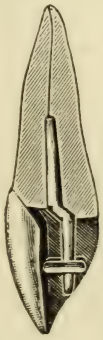
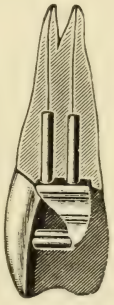


Fig. 2.



For bicuspids a small metal framework, as illustrated in Fig. 2, with two root-posts is employed, these posts to be considerably thinner and shorter than those required in incisors and canines. The danger of dissolution of the cement used in fixing the crown is no greater than in any ordinary inlay, the fit of the facing and metal base being very accurate. This method also allows of a modification—the porcelain facing need not be invested together with the wax pattern, but can be removed after the carving, and fastened to the gold portion with cement, thus avoiding any risk of its checking during the casting, also allowing of its ready replacing by a new facing in case of breakage.

[*Le Laboratoire et le Progrès Dentaire*, Paris, March 13, 1910.]

REPAIR OF PERFORATED GOLD CROWNS WITH CAST HOLLOW GOLD INLAYS.

By H. Léger-Dorez.

If the masticating surface of a gold shell crown has been perforated by use, it is very disagreeable to remove the crown, even well-nigh impossible if the crown is the main abutment for a cemented bridge. In a crowned third molar the following procedure may be followed in the repair of the perforation: After

removing all carious portions and sterilizing the cavity, the latter is shaped up and enlarged with a big round bur, so that no undercuts remain. With a fair-sized carborundum wheel, the edges of the cavity are gone over in every direction so that it presents the shape of a funnel with beveled periphery. A pellet of soft wax is then introduced into the cavity, and the patient is asked to bite with all his force. The excess of wax is removed, the sprue is inserted, and the wax pattern is rocked from the cavity and mounted on the crucible former. In order to obtain a hollow inlay, the wax model is invested, up to the surface which is to come in contact with the fundus of the cavity, in fine investment material, which is allowed to dry. After the investment has attained a sufficient hardness, the interior of the wax model is hollowed out carefully with a hot spoon-shaped excavator. The whole is then immersed in pure cold water for ten minutes. The hollow portion of the wax model is painted with thin and fine investment material, the formation of bubbles to be carefully avoided. After a few hours' hardening, the inlay is cast, and after finishing is set in the usual manner. In this way a restoration at reasonable cost and of reliable durability is obtained in a very short time.

[*Deutsche Zahnaerztliche Wochenschrift*, Munich, March 19, 1910.]

CREASOTE-IODOFORM AS A CAUSTIC IN DECIDUOUS TEETH. By Dr. A. Witzel.

The best method of mixing creasote and iodoform consists in pouring creasote over a certain quantity of iodoform, and shaking the mixture at intervals until everything is dissolved. At any rate an excess of iodoform should be present, in order to make sure that the solution is saturated. Any undissolved iodoform that remains at the bottom in form of a paste may be used as a root-canal dressing, which has the advantage of never hardening and being of a staple and uniform consistence. In order to avoid decomposition of the iodoform and splitting-off of the iodin, the solution is preserved in a dark-colored bottle in a dark place. This solution is admirably suited for the devitalization of pulps in deciduous teeth, in which arsenous acid, owing to its uncontrollable effects beyond the wide apical foramen, is contra-indicated. If, for instance, a child presents with painful pulpitis in a second molar, the food débris and softened dentin are removed carefully and without pressure with sharp excavators. As soon as sensitivity is noticed, the cavity is desiccated and a pledget of cotton saturated in the solution is introduced and sealed in temporarily, whereupon the pain generally disappears immediately and lastingly. The further removal of softened dentin produces little or no pain, and the dressing is renewed and allowed to remain in the cavity for from one to two weeks. The inflamed pulp can finally be exposed painlessly, whereby a safe and rapid action of the solution is assured. The dressing is renewed until the pulp can be painlessly removed with a broach, after the cavity has been previously flooded with the solution. The root can be filled with the creasote-iodoform paste sealed in with a temporary cement filling. If within a week no pain is noted, a permanent amalgam or cement filling can be inserted. Subsequent periostitis has never been observed in deciduous teeth treated by this method.

Periostitis of infectious origin can be successfully and rapidly combated with a creasote-iodoform-iodin solution in deciduous as well as in permanent teeth. This solution offers the inestimable advantage over other solutions, such as tricresol-formalin, that it has no irritating effect upon the periosteum or the pulp fragments, but rather acts as an anodyne.

[*Journal of the American Medical Association*, Chicago, April 16, 1910.]

CARCINOMA OF THE TONGUE. Editorial.

Much of the recent discussion concerning the increase of cancer is confined to statistics relative to cancer of the uterus, breast, and stomach. It is pertinent, therefore, to call attention to a form of carcinoma of the epithelioid type (epithelioma), which is quite as fatal as any other.

Of the epithelioid type, carcinoma of the tongue is much more frequent than is commonly supposed. Andrew of Glasgow presents some very surprising statistics relative to epithelioma of the tongue. Of 118 cases comprising various diseases of this organ, such as abscess, hematoma, glossitis, leucoplakia, papilloma, and tuberculous ulcer, 98 were cancer of the epithelioid variety. Of the 98

patients, 88 were males and 10 were females. These figures are similar to those obtained for cancer of the lip. Andrew found that in 469 cases of epithelioma the order of frequency was: Tongue, lower lip, esophagus, penis, cheek, larynx, and tonsil. In other words, epithelioma of the tongue comprised 20.8 per cent. of all cases of epithelioma seen during a period of ten years. Of the 118 cases there was only one case of tongue syphilis, or 0.8 per cent. The tongue and floor of the mouth are very rich in bloodvessels, and this, combined with the constant muscular movement of the tongue, produces a quick extension of the cancerous process into the lymphatic and submental and submaxillary glands.

The entire statistics cited by Andrew cover the history of over 40,000 cases of general diseases, and bear out the opinions of rhinologists and stomatologists, who naturally see cases of tongue disease more frequently than the average general practitioner.

It needs to be emphasized that tertiary syphilis is rare in the tongue, a fact which is by no means well known. Recently three cases were reported in which several physicians diagnosed gumma of the tongue, and the patients were given iodids in large doses. Each of these cases, when a section of the tongue was taken, proved to be epithelioma, and all were practically inoperable at the time the true diagnosis was made. However, if the patient has had an initial syphilitic lesion, it is necessary to be on guard, for Brandt of Berlin says that it is not uncommon to find carcinoma arising from the base of a syphilitic ulcer, and Koerner of London has seen at least twelve undoubted cases in the tongue. These observations are somewhat discounted by the statement previously made relative to the infrequency of syphilitic tongue conditions, but the possibility should be kept in mind.

A leukoplakia, a fissure, or an ulcer of the tongue should not be temporized with, but a portion of the growth should be submitted early to microscopic examination. It need scarcely be stated that the cure of cancer anywhere in the body depends on early diagnosis and complete eradication. Anything short of this means that the patient is deprived of the only opportunity he has of preventing a speedy and fatal termination of his malady. It is well, therefore, to be constantly on guard as to all suspicious lesions of the tongue.

To dentists, who very frequently are the first to see any symptoms of pathological alterations of the epithelial tissues of the mouth, tongue, and lips, this editorial carries a message of grave duties beyond the merely mechanical repair of the teeth.

[*Bulletin du Syndicat des Chirurgiens-Dentistes de France*, Paris, April 1910.]

CONTRIBUTION TO THE STUDY OF COCAIN ANESTHESIA. By Dr. L. Vichot.

Vichot, following Schleich's suggestion, has made a series of experiments in men and monkeys with the purpose of reducing the toxicity and increasing the efficiency of cocain anesthesia by the admixture of sodium chlorid, arriving at the following conclusions: The application of a solution of ½ per cent. hydrochlorate of cocain in 2 per cent. sodium chlorid abolishes the pain caused by the infiltration. The admixture of the 2 per cent. sodium chlorid permits the injection of a greater quantity of the anesthetic by infiltration, increasing the anesthetizing effect of the cocain. This admixture also diminishes the toxicity of the cocain, affording perfect safety to operator and patient. For these reasons the quantity of injected liquid can be increased in case of poor gingival conditions, which influence most unfavorably the effect of the injection. The greater extent of the anesthetized area allows of a wider extension of the field of operation in cases where otherwise general anesthesia would have to be resorted to.

[*La Odontología*, Madrid, April 1910.]

TREATMENT OF AN EPULIS WITH ARSENOUS ACID. By Dr. O. Amoëdo.

The patient presented an epulis situated between the upper first and second left molars, measuring 2 cm. in breadth, 1½ cm. in height and 8 mm. in diameter. It was pedunculated, the stalk starting from the interdental space. Both molars had approximal cavities, the first presenting a live and exposed pulp, the second being affected with caries of the second degree. The gingivæ of the whole mouth were inflamed, owing to lack of care of the mouth. Excision of the tumor, extraction of the neighboring teeth, and extirpation of the interdental osseous wall were contra-indicated,

the patient being pregnant and exceedingly nervous. Dr. Amoëdo therefore thought of utilizing the caustic property of arsenous acid, which he applied in the following way: Between the tumor and the approximal walls, well up against the pedicle, a pellet of cotton was introduced saturated with phenol, and containing the same quantity of arsenous acid as is employed for the devitalization of a pulp. This was covered with cotton saturated with aristol. The night following this application the patient experienced pain such as is usual on applying arsenous acid to a pulp. Three days later, the tumor and its pedicle were atrophied and could be removed with a pair of pliers. The region was well washed and the tissues saturated with a solution of dialyzed iron, in order to obtain an insoluble arsenite of iron and thus prevent any further action of the arsenous acid on the bony tissues. A week later, on examination with a sound, the interdental bone was found to be necrosed, the sequestrum to be expected to appear within from two to three months. The examination of the removed tumor proved it to be a small osteofibroma, which justified the destruction of the bony wall in which the pedicle had been implanted. When the patient was seen last, the gingiva was quite sound and rosy at the former seat of the tumor, while the rest of the gingivæ were red, and bled easily. This method of procedure is not without grave danger, and requires great prudence. Only a very small amount of arsenous acid can be applied, and as soon as this has produced the desired effect, an insoluble compound of arsenic must be produced by impregnating the tissues either with dialyzed iron, with hydrated magnesia as recommended by Dr. Capdepont, or still better, with silver nitrate or one of the organic compounds of silver, which penetrates the tissues more deeply, as indicated by Dr. Kirk.

[*Les Annales Dentaires*, Paris, March 1910.]

SILVER NITRATE SPOTS. By Dr. J. Quintéro, Lyons.

The excellent services of silver nitrate in arresting caries are unfortunately impaired by the black spots left on the teeth after its application, which may be no serious drawback in the treatment of children, but almost forbid its use in adults. In order to remove these black spots, the author makes a fresh and almost saturated solution of potassium iodid in tepid water, and by adding this to some finely pulverized pumice, obtains a paste of creamy consistence. With a properly shaped orange-wood stick dipped in this paste the black spot is polished until it disappears. If this is done carefully, one sitting may be sufficient. In cases where the discoloration has penetrated rather deeply, extremely fine stones, first Scotch then Arkansas stones, are used for very slightly grinding the discolored surface, which is then polished with the iodid and pumice paste dressed on felt disks. In order to protect the gingivæ against the action of this paste, the rubber dam should be employed. Since the potassium iodid solution must be made fresh for every case, it is wise to have the drug at hand in crystal form. The author avers that the application of the potassium iodid does not in the least impair the good effects of the silver nitrate, which endure after the removal of the black color, thus safeguarding the usefulness of one of our most important accessories in the control of dental caries.

[*Deutsche Monatsschrift fuer Zahnheilkunde*, Berlin, March 1910.]

MASSAGE OF THE GINGIVÆ AND JAWS. By Dr. Erich Feiler, Breslau.

The author gives a careful and lengthy review of the German dental literature in which gingival massage has been discussed, concluding that massage in inflammatory conditions and as a preventive has been unduly neglected. Its importance as a remedial agent in pyorrhea alveolaris has been more fully recognized. Following Partsch's suggestion, Dr. Feiler has the patient use his finger, wrapped with cotton and dipped into an antiseptic solution, as a sort of massage brush, in all inflammatory conditions of the gingivæ and the mucosa, also as an indispensable means in the preparatory treatment of the mouth before the insertion of a prosthetic piece. As an antiseptic, a three per cent. solution of hydrogen dioxid is used, and the affected portion is rubbed vigorously ten to twelve times in every direction. After having been shown once, the patient can easily massage his own gums once or twice daily, especially before retiring. Even in very aggravated cases, the pain readily ceases, and the discolored gingival tissue

resumes its natural rosy shade. Bleeding on slight contact, especially on cleaning the teeth, disappears entirely under this self-applied treatment, also the disagreeable continuous taste of blood which is frequently noted.

Massage is especially indicated in all kinds of gingivitis, the painful inflammations disappearing rapidly after removal of the causative factor. In mercurial stomatitis, due to specific mercury treatment, it is advisable to protect the massaging index finger with a rubber cot, and to disinfect the hand carefully afterward. The iodoform paste or isoform powder recommended for obstinate cases seems to be secondary in its beneficent effects to the massage itself, which attracts fresh blood to the affected parts and stimulates their nutrition.

In tardy eruption of the third molar, the process of exfoliation of the necrosed pocket, and thence the healing of the whole painful process, is accelerated by careful massage; it is recommended, however, to previously paint the respective portions with a ten per cent. solution of cocain, or to inject a ten per cent. solution of cocain between the gingivæ and the tooth in order to avoid any aggravation of the pain.

In all stages of pyorrhea alveolaris regular and systematic massage of the gingivæ and the alveolar process has proved itself invaluable. After the indispensable thorough removal of tartar by the Younger method, the healing process is considerably hastened by gingival massage. Besides lactic acid as recommended by Younger, tincture of iodin introduced into the pus pockets on Japanese bibulous paper wrapped around a Miller broach is recommended for the reduction or stoppage of the flow of pus. Under this combined treatment loose teeth quickly become firm again and serviceable for a long time.

Before and after extractions massage is indicated as having a hemostatic effect. In hemophiliacs profuse hemorrhage has been prevented in that way. Extraction wounds exhibit a far greater tendency to healing if treated by massage, which is therefore a valuable accessory in the preparation of a mouth for the wearing of a prosthetic apparatus. The tissues of granulation rapidly assume a firm and solid consistence, so that the trouble to both operator and patient of temporary dentures can be avoided. Osseous fragments and spurs, which are very painful, are readily resorbed and healed, doing away with a second and painful operation. Care must, however, be exercised not to massage too vigorously, as the gingivæ may become wounded. Frequently it is necessary to omit the massaging for a day or two between the first and second treatments. The pain ceases, however, after at least eight days.

In edentulous jaws, the mucous folds that frequently dislodge an artificial denture and which are a serious bugbear to the prosthetist, disappear under massage, which has a very beneficial influence on the mucosa, rendering the tissues firm and resistent. The flexibility and softening of the alveolar process that is observed in edentulous patients, and which offers almost insurmountable difficulties in the fitting of a prosthetic piece, may also be overcome within from eight to ten days by massage. The author is at present engaged in experiments, which bid fair to prove successful, with a view to reducing, by massage of the alveolar process, the time of wearing of retaining fixtures after regulation.

[*Revue Internationale de Prothèse Dentaire*, Paris, May 1910.]

DENTAL EROSION AND TUBERCULOSIS.

By Dr. G. Petit.

Following his observations on the coexistence of dental erosion and tuberculosis, published in 1898 in his article on "Tuberculosis in Children," and which have since been confirmed by many investigators, the author has subjected one hundred cases of tuberculous children between the ages of five and sixteen years to a most rigid examination of the mouth and teeth. The symptoms about to be described were never noticed in children below five years of age. Of the 100 patients examined 63 were affected with pulmonary, 12 with osseous tuberculosis, 25 were so-called "candidates," exhibiting hereditary predisposition, anemia, and scrofulosis. Discarding the now rather discredited theory that erosion is due to the alteration of the tooth under the influence of an organic acid, and regarding erosion as the result of some imperfection in the formation of the hard tissues of the tooth, due to diathesis or environment, the coexistence of erosion and tuberculosis as observed by the author leads him to con-

sider erosion as a very valuable factor in early diagnosis of tuberculosis, justifying his axiom that dental erosion in children is a complementary and positive symptom of that affection. Dental erosion in tuberculous children affects equally the deciduous and the permanent teeth, and is noted most frequently in the canines. Cuspal erosion is the typical form. Sex does not seem to play any rôle, the affection appearing with equal frequency in boys and girls. Generally the erosion is located at the extreme cusps, the tooth appearing worn and shortened. Canines generally present the shape of a cone surrounded by a circular groove. The forms of erosion typical for Hutchinson's and Tomes' teeth have never been observed in tuberculous cases. After reviewing the theories advanced in explanation of dental erosion [which may be found fully specified in Dr. J. Cavallaro's article, DENTAL COSMOS, December 1908, p. 1326 ff.], Petit partly sides with Bouchard, who regards rhachitism as a disease of retarded nutrition, which, as in the case of tuberculosis, retards the calcification of the osseous tissues. Comby as well as Petit denies the occurrence of dental erosion in rhachitis, which simply proves that a wide field is still left open for deciding what part rhachitis and tuberculosis individually play in dental erosion. Until these investigations are completed, all anemic, debilitated, scrofulous, or rhachitic children are to be subjected to a scrutinizing examination for tuberculosis, the more so since many children's diseases, such as measles, scrofulosis, rhachitis and others, are more and more coming to be regarded as being closely related with tuberculosis.

[The term *erosion* is here used to signify that defective formation of the hard structures of the tooth described as atrophy by some, and more accurately as hypoplasia by other writers.—ED. DENTAL COSMOS.]

PERISCOPE.

Cleaning a Cement Mixing Slab.—Submerge the slab for a few minutes in water to which a few drops of nitric acid have been added.—*Revista Odontologica Paulista.*

To Impart a Brilliant Black Color to Old Instruments.—One part of sulfur and ten parts of essence of turpentine are boiled, giving a sulfuric oil, with which the instrument to be tarnished is very slightly coated. The instrument is heated over an alcohol lamp until the desired tint is obtained.—*Laboratoire et Progrès Dentaire.*

Replacing a Broken Tooth in a Fixed Bridge.—If from a fixed bridge a porcelain tooth is broken off, the backing and the pins are freed from adhering remnants of porcelain. Then, without moving them, the pins are fixed with cement, and a matrix is taken of the backing with gold or platinum foil. A new porcelain tooth is ground to fit in the place of the broken one, the hardened cement is removed from around the pins, and the new tooth is cemented to place.—F. FERRAND, *Journ. Odontologique de Paris.*

Controlling Shrinkage in Porcelain Inlays.—A precaution against shrinkage in porcelain inlays for labial cavities of some size, indeed for all cavities where a core can be used, consists of a fine core as a brace across the long diameter of the impression after the deeper portion has been slightly built up. Scoring the body with a point of the spatula or cutting furrows therein when the alcohol has been dried off, will help to control shrinkage.—W. F. MELLERSH, *Dental Record.*

Canada Balsam for Cavity Lining.—Coat all cavities with a thin, syrupy solution before inserting a filling—except porcelain and cast gold—and in deep-seated cavities add a little cement or a disk of asbestos, as the case demands.

Take care to cleanse the margins with chloroform.

A little warm air will quickly dry it, but that is not essential.

Another useful office of Canada balsam is that of an adherent, if one may apply the term.

A cavity that will not bear comfortably

a current of warm air will show surprising results after the use of Canada balsam.

Its use is such a simple and inexpensive performance that one wonders at its omission.—C. R. Scholl, *Garretsonian.*

A Fusible Metal.—Dr. H. Izel recommends the following metal, which melts at a temperature lower than the boiling-point of water, and is harder and contracts less than many other metals. The formula is this: Bismuth 200 grams, lead 100, tin 100, cadmium 25.—*Revista Odontologica Paulista.*

Uniformly Good Investment Materials for Casting.—The following formulas for uniformly good investment materials, so important for successful casting, are suggested: For a fine investment, one part of talc, one part of amianth, three parts of plaster of Paris; for a coarse investment, one part of sand, two parts of wall-plaster.—A. Pont, *Province Dentaire.*

Treatment of Metallic Stains.—The metallic stains found in the dentin are best removed by transforming the insoluble metallic salt into a soluble one. The most frequent and practicable course is to form soluble chlorid through the action of nascent chlorin. Copper, nickel, gold, and iron stains should be subjected to the chlorin method of bleaching, followed by repeated washing with chlorin water, 50 per cent., and hot distilled water to remove the chlorid formed. For mercurial stains Kirk recommends the use of aqueous ammoniacal solutions of hydrogen dioxid after the chlorin method, followed by washing with hot distilled water.—M. B. Long, *Penn Dental Journal.*

Treatment of Oral Inflammations.—The following measures should also be employed in conjunction with the general treatment [see next column]: A hot foot-bath administered just before retiring, in the following manner: Have the patient secure a large container in which the limbs can be immersed almost to the knees. Begin by filling this container more than half full with water as hot as can be borne. Place the feet in the water and add boiling water at intervals for half an hour or longer, keeping the water all the while as hot as the patient will bear. Continue the bath for at least half an hour. Apply a counter-irritant to the gum surrounding the affected part. In case of abscess obtain drainage through the pulp-chamber, or a fistula made by the lancet. In painful eruption of the third molar, scarify freely and cauterize the surface with carbolic acid. When the patient retires, apply a poultice to the entire affected side of the face and neck. The foot-bath relieves pressure in the vascular extremities above, by attracting more fluids of the body to the lower extremities. The counter-irritant dilates the smaller vascular organs in the parts contiguous to the infected area, thus relieving the pressure at the center of congestion and pain. The poultice relieves the pressure in the bloodvessels by exchange of liquids from the vascular organs to the poultice and *vice versa*, through the process of osmosis, in which the skin is the membrane through which this exchange is carried on.—C. M. McCauley, *Dental Era.*

General Treatment for All Cases of Acute Alveolar Abscess, or Painful Eruption of Third Molars.—One minim of tincture of aconite given in 1/10 minim doses every half-hour for five hours before retiring. Give ten grains Dover's powder at bedtime, and instruct the patient to sleep with the head well elevated. This treatment will have the desired effect on the skin, and produce restful sleep. This should be followed the next morning by a Seidlitz powder or large dose of Epsom salts in warm water before breakfast, for the purpose of opening the bowels. Three grains of calomel will often be of service in restoring normal secretions to the alimentary canal in cases which are slow to respond. This should be given the following evening, followed again in the morning by a saline laxative. This treatment applies equally to ordinary cold or coryza.—C. M. McCauley, *Dental Era.*

Mouth-Disinfection and Diphtheria.—The need of mouth-disinfection is particularly felt in ships, where men live much more closely in association with one another. Special attention is given to this risk, we learn by recent publications, in the American and German navies.

Dr. J. D. Gatewood in his recent work on "Naval Hygiene," mentions this risk in relation to syphilis, tuberculosis, diphtheria, influenza, pneumonia, measles, mumps, and scarlet fever. There is a special source of danger in the American navy, as drinking-cups, used by all, are attached to the ordinary drinking-tanks on the living decks of their ships. To obviate risk some of the ships keep these drinking-cups lying in a formalin solution, while others have adopted an expensive mechanical device to secure that the men shall always drink from running water. In the last sanitary report of the

German navy, twenty-four cases of diphtheria are reported, all but ten of them isolated cases. These ten occurred in certain messes in a training-ship. The patients were at once removed, their plates, knives, and forks, and their clothing disinfected; still cases continued to occur. It appeared likely that the boys who returned from the hospital were, in spite of careful mouth-disinfection in the hospital for a week after recovery, still "carriers," and that they must be infecting the mess utensils. It was decided to regularly boil these mess utensils and to make all members of these messes gargle daily, under supervision, with hydrogen dioxid. The effect, we learn, was striking—the epidemic ceased.—*Lancet.*

Necessity of a Collection of Models in Orthodontia.—A large collection of models will show the various classes of malocclusion, and will make plain the groups into which these cases are easily divided when "the hang of the thing" is once understood. The general practitioner fails in his conception of orthodontia treatment through his lack of this knowledge almost more than anything else, and is thereby often led to sidestep easy cases because they look hard, and attempt hard ones because they look easy. If every practitioner had a good big collection of models to study he would know more of malocclusion, and incidentally more of everything else in dentistry.—W. J. Brady, *Western Dental Journal.*

A Base for a Richmond Crown.—This crown base was intended for porcelain, but can be used equally well for gold. First, prepare the root in the usual way, except in front, where you cut it sufficiently short to allow the gum to entirely cover the joint. Prepare the canal to receive a Logan crown pin, making it fit perfectly, or so that it will require some force to remove it. Then take a piece of platinum plate of No. 33 gage sufficiently large to extend over the margin of the root to bend down to make the band, punch a hole near the center and force the pin through it, and burnish until it conforms to the exposed end of the root, having the pin in position; remove them both together and solder with pure gold. Then put it back in position and with a large plugger in the automatic mallet drive the platinum disk down against the root until you have outlined the exact size of the root on the under side of the disk. Remove, and with a pair of plate shears cut a number of slits from the periphery of the disk to the outline of the root, and with a small pair of flat-nosed pliers bend the slit edge of the disk to form the band, allowing the slits to overlap each other. Place it back in position and with a large foot plugger in the automatic mallet drive the partially formed band closely around the root. Remove again, and with a wheel on the engine grind the overlapped edge of the band to a feather-edge; then take a strip of platinum plate of No. 36 gage just as wide as you are making the band, and with a pair of pliers hold the center of the strip against the palatal or back portion of the feather-edge band, and solder it together at that point with pure gold. Then, with the fingers, press the ends of the strip down closely around the sides of the band, holding it in position while soldering. This strip and gold not only reinforces but restores the lost form of the root, and when properly executed makes a perfectly fitting base for a crown.—James E. Boyd, *Dental Summary.*

Anchoring in Cast Gold Inlays.—We see but too often the failure on the part of the dentist to be able to obtain sufficient anchorage for a gold filling in cases where a corner of an anterior tooth has broken away. The cutting edges of such teeth are often so narrow that anchorage along them is impossible, and when anchor screws are used the gold frequently breaks away.

In cases of this kind I have resorted to the gold inlay, as follows: First obtain a good separation of the teeth by wedging. After preparing the cavity with an undercut toward the cervix at right angles to the incisal edge, and so that the wax will draw easily, and after smoothing the margins, make a model of the wax and cast an inlay of pure gold in the usual way. After obtaining the proper seating of the inlay in the cavity, anchor a long anchor screw wire into the dentin at right angles to the long axis of the tooth. For anchoring the screw wire I do not depend upon the thread entirely, but use a thin mix of inlay cement when seating the wire. The cement also prevents discoloration. After cutting the wire to the right length, I drill a hole into the inlay to admit the wire, and make a small dovetail at the bottom of the hole. It is sometimes necessary to make a groove from the hole toward the cervix to allow the passage of the wire when seating. This groove can be dovetailed. The inlay is then properly adjusted and cemented into place.

This method makes a very strong and beautiful restoration of the broken tooth.—B. T. Mason, *Garretsonian.*

A Porte-Polisher for Holding Orange-wood Points.—To construct a useful porte-polisher for orange-wood points, cut the hub from an old hypodermic needle and solder it to the shank of an old cone-socket instrument. The orange-wood "pegs" can be readily inserted by screwing them into the hub, the threads holding them securely. By placing this on a cone-socket handle, a substantial porte-polisher is obtained. I make them for patients to use at home in prophylaxis treatment.—R. L. Hesser, *Dental Summary.*

Wax-carving Pencils made of Waste Investment.—After using what investment the case requires, dip some old hand instruments in the mix, allowing a thin coat of investment to cling to the instrument; pour the remainder on a glass slab, and work it to a sheet about one-fourth of an inch in thickness so that it can be cut into suitable shapes and sizes. These investment pencils when heated and held against the wax model will melt and absorb the excess.

The finest lines and points, surfaces smooth or rough, undercuts or any like removals, are made quickly and easily; the pencils may be used repeatedly, as the wax burns out on being re-heated.—J. L. Smith, *Western Dental Journal.*

Retaining Appliances in Orthodontia.—The retaining appliance is fully as important in orthodontia as the original apparatus for correction—in fact more important, for the teeth *might* be moved into place with a very indifferent appliance, while the retainer *must* meet certain requirements, else the teeth will move back toward their old positions, and the case end in dismal failure. Every practitioner with any experience in orthodontia knows this to his sorrow. Yet the beginner is likely to estimate the retaining appliance very lightly, and runs a much greater chance of failure through a poor retainer than through a poor regulating appliance. Therefore make the retainer with as much care as a piece of bridge work; make it strong enough; and lastly, leave it on long enough to do some good—at least one year.—*Western Dental Journal.*

Effects of Chronic Nasal Obstruction during Childhood upon the Growth of the Teeth and Jaws.—Deformities of both the upper and lower jaws, accompanied by more or less irregularity and crowding of the teeth, are very common among those who have suffered from long-continued nasal obstruction in early life. These changes are, in my experience, more rarely seen or much less marked in children under the age of five years.

The most important causative factor is the lateral compression exercised upon the jaws as the result of the stretching of the cheek muscles consequent upon the mouth being constantly open.

Direct contributory causes depending also upon mouth-breathing are: (1) Lack of sufficient use of the jaws; (2) absence of the spreading action of one jaw upon the other and the molding action of the tongue, and (3) the short upper lip.

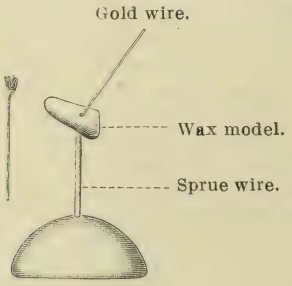
Remote contributory causes may, in certain cases, play a part. Some of these are hand-feeding, improper feeding-bottles, sucking of the thumb, rhachitis, the absence of teeth, etc.

Treatment should include (1) the establishment of efficient nose-breathing as early as possible, by the removal of any obstruction, by correction of the habit of mouth-breathing, by chin-straps or other devices for keeping the mouth closed during sleep, and by breathing exercises and physical culture, and (2) early attention to deciduous teeth, both as regards their preservation and manner of eruption, by correcting faults in mastication, and by the carrying out of properly conducted and suitable chewing exercises.—J. Stoddart Barr, *British Dental Journal.*

HINTS, QUERIES, AND COMMENTS.

METHOD OF REMOVING A WAX MODEL FOR A GOLD INLAY FROM THE CAVITY WITHOUT DISTORTING.

TAKE a piece of about two-centimeter length of very thin gold wire of from 22 to 24 karat, the gage being the same as in the thinnest of Angle's ligature wire. At one end of the wire make a small knot. (See figure.) Em-



bed the wire in the inlay wax, and shape and finish the model. By slowly pulling the wire, the model will come out of the cavity without being distorted. The model is invested, burned out, and the inlay cast with the gold wire remaining in position. Upon finishing the inlay, the wire is cut off.

HERBERT KUEHNEN, D.D.S.

Berlin, Germany.

DIFFICULT CASES IN EXCESSIVE JAW-ABSORPTION.

THE following case is an interesting one: There remain in the mandible the anterior teeth together with one bicuspid root on the left side, which has been crowned and is very loose. The patient is in need of an upper denture. What should be done to the lower jaw in order to make the upper denture a success?

The retention of the crowned left bicuspid root is entirely contra-indicated, as the upper denture must be evenly balanced, which is impossible, there being no tooth on the right side to counterbalance the pressure on the left side. It is impossible to construct a bridge for the right side, as there is no molar to serve as abutment. A plate will sooner or later settle, resulting in the contact of the lower anterior teeth, which should never be permitted, as two unfortunate conditions evolve therefrom—viz, displacement of the upper denture and undue pressure across the anterior margin of the jaw, causing further absorption of the bone and leaving what is often called a flexible ridge. In such a case the removal of the root, or even of a sound tooth, if present, is imperative, and a plate must be inserted. The pressure is then uniform, as the plate is equally balanced on each side. If the denture should settle in the course of time, so as to bring pressure to bear on the anterior lower teeth, the teeth are removed from the plate and the bite is raised.

Another case which was recently treated for another dentist presented the following unfortunate conditions:

The excessive absorption of the upper jaw has left a very small surface, while the lower jaw is broad with teeth remaining. The two right bicuspids and one left bicuspid form an unusually broad arch, even being out of alignment buccally with the canines.

There is a marked protrusion of the lower teeth, which is always a very unfortunate condition. The right second bicuspid being shorter than the first, a decidedly inclined plane is present, which is always a serious impediment to occlusion. The three remaining lower bicuspids protruding beyond the canines, the left one for one-half of its width, the upper bicuspids would have to be set up by half their width inside the lower ones, resulting in a very small surface of occlusion. As the lower molars must be replaced in order to secure masticating surfaces, the pa-

tient will be infinitely better off if the three bicuspids are removed and replaced by a properly fitting plate, thus not only improving mastication but also the appearance of the face, the lower lip having been abnormally broadened.

The question of the extraction of certain teeth, even if sound, simply resolves itself into the question of what shall be done in any given case in order to render the artificial denture most useful, comfortable, and presentable. Dogmatic views, as so often propounded, should not interfere with the best interests of the patient.

L. P. HASKELL.

Chicago.

PERFECT TEETH PRESERVED TO A GREAT AGE.

ON April 30, 1910, the writer was called to a French Canadian woman of eighty-four years of age. All the permanent teeth were found to be preserved in the mouth, and no cavities were noted. There was quite a heavy deposit of calculus on the lingual surfaces of the lower anterior teeth. The upper left third molar was causing irritation on account of its looseness, and was consequently removed, this being the first one of the patient's permanent teeth to be extracted.

H. A. DONAHUE, D.D.S.

Essex Junction, Vt.

OBITUARY.

DR. WILLIAM HIRAM TODD.

DIED, June 19, 1910, at his residence, 909 Bryden road, Columbus, Ohio, WILLIAM HIRAM TODD, D.D.S., in his fifty-sixth year, after a short illness from aortic regurgitation.

In the death of Dr. Todd there passes one of a name associated with dentistry in Columbus, Ohio, covering a period of over seventy years, through a practice established by his father in 1839 and carried on continuously, with the exception of the first few years, in the same office. A brief history of the father is as follows:

CAREER OF THE SENIOR DR. TODD.

Hiram Todd, the father, was born in Plymouth, Litchfield county, Conn., August 5, 1808. Being of an ingenious turn of mind, he went to New York city when a young man and entered the employ of a watch and clock manufacturer. During this period he became interested in and took up the study of dentistry, and in 1838 opened an office in that city. The following year, his former employer having contracts for placing a clock in Detroit, Mich., and one in Trinity Church, Columbus, Ohio, and knowing the skill of his former employee, urged him to accompany him on the trip and assist in placing the clocks in position. On the return journey to New York Dr. Todd stopped at Reynoldsburg, N. Y., and having brought his dental outfit with him, opened an office, but remained there only a short time, when he returned to Columbus to settle down to the practice of his profession. He was a pioneer dentist in Columbus, a fine specimen of vigorous manhood; he was also strong in his likes and dislikes, was an original thinker and an inventive genius—as many instruments and appliances made by him bear evidence. He was a successful practitioner, and was an expert in porcelain inlays, his method being to select a tooth of the desired shade and grind a piece of porcelain to fit the cavity, an art in which he was highly proficient. In recognition of his professional ability he received the honorary degree of D.D.S. from the Ohio College of Dental Surgery in 1872.

During the early years when the practice of dentistry partook of itineracy, he met, at Granville, Ohio, Miss Carrie E. Wright, then a teacher in the Granville Seminary. She was the daughter of Silas Wright, and was born at Dorchester, N. H., in 1831. They were married January 1, 1851. To them were born William H., Caroline, who married William S. Stimson of Columbus and who died in 1895, and Florence, who mar-

ried Richard Hopkins and who resides at Short Hills, N. J.

Dr. Hiram Todd died August 22, 1884, of paralysis and old age. His wife died in 1903, of pneumonia, at Short Hills, N. J. Both are buried in Green Lawn Cemetery, Columbus, Ohio.

DR. WILLIAM H. TODD.

Dr. William H. Todd was born at the old Todd residence, May 10, 1854, and continued during his whole active life the practice established by his father. He received his early education in the public schools of his native city, leaving the high school shortly before being graduated. Showing evidence at an early age of the ability and skill that later characterized his operations, he began his dental pupilage in his father's office about 1871, continuing with him as a student and later as a practitioner until he entered the Ohio College of Dental Surgery, from which institution he was graduated in the class of 1882.

From that date he was an active participant in dental affairs in his city and state. He became a member of the Ohio State Dental Society in 1882, and served on its various standing committees during the entire period of his membership. He was elected president of the society in 1895, and served on its board of directors continuously from 1891 until his death. His executive ability as chairman of the committee of arrangements from 1898 to 1906 contributed in a marked degree to the present prosperous condition of the state society. He was also a member of the National Dental Association, and of the Northern Ohio and the Columbus Dental Societies. In these organizations he was an interested worker, contributing to the meetings and giving encouragement and support to any measure tending to promote professional progress. He advocated the highest standard of dental ethics, while he defended with passionate loyalty members of his profession when unjustly assailed. His character was ever marked by devotion to the best interests of his profession and by able and conscientious effort to uphold its dignity and honor.

A man of deliberate judgment, his expression of opinion was respected, and went far toward molding the sentiment of his *confrères*. His discussions, though brief, were enforced by a knowledge of facts that usually carried conviction. His professional skill was of a high order, and brought to him a choice *clientèle*. His experience, with his quick perception of means to accomplish results, was a valuable asset, and in him his fellow practitioners found a willing adviser and an invaluable consultant.

He was a lover of art and books, and his fondness for the latter enlisted his interest at the founding of the Ohio Dental Library Association in 1905. He was its first president, and held that office at the time of his death, much of the success of the association being due to his moral and financial support.

He was fond of travel and was also an enthusiastic sportsman, usually spending his vacations on extensive hunting and fishing trips; in fact, a portion of the day preceding his death was spent at Buckeye Lake with his sons, testing a motor boat that he had recently purchased.

Dr. Todd was an honorary member of the Xi Psi Phi dental fraternity. He was a thirty-second degree Mason, being a member of Scioto Consistory, A. A. S. R. of Aladdin Temple of the Mystic Shrine, and of Goodale Lodge, No. 372, F. and A. M.

He married, August 6, 1884, Miss Flora Barcus, daughter of the late James H. Barcus, for many years a prominent merchant of Columbus. The widow and two sons, William B., age thirteen, and Henry E., age eleven, survive him.

In his death there passed from the field of action a man of commanding personal presence, whose appearance inspired respect and confidence, which increased as acquaintance grew. Whether before a meeting, in his office, in his home, or indulging his enthusiasm for sport in the pathless forest or angling along some meandering stream, he ever showed that generous and enterprising disposition, with spotless integrity, which distinguished his personality. His untimely death came as a shock to countless friends, and his loss is one the profession can ill afford. He did not live in vain, and it may be said of him that—

"His life was gentle: and the elements
So mixed in him that Nature might stand up
And say to all the world, 'That was a man.'"

EDWARD C. MILLS.

DR. C. B. ROHLAND.

Died, at his residence, 1217 State st., Alton, Ill., June 29, 1910, Charles B. Rohland, D.D.S., in his sixty-fifth year, from heart failure due to renal disease.

Dr. Charles R. Rohland of Alton was one of the foremost men of the profession in Illinois. He had long suffered from kidney disease, and early in the present year felt that he must take life easier, and decided to get an assistant in his office who should bear the burden of the work. Since effecting that arrangement he had himself been very little at the office.

He was born at Lebanon, Pa., March 24, 1845, and was educated in the Lebanon public schools and afterward attended Union Seminary at New Berlin, Pa., in which he subsequently taught. Later he studied at Dickinson College, Carlisle, Pa., and was there given the degrees of B.A. and M.A., and was graduated with the second honors of his class. Turning to dentistry, he matriculated at the Pennsylvania College of Dental Surgery, and received his degree of Doctor of Dental Surgery in 1869 from that institution.

Dr. Rohland went to Alton in 1869 and opened an office for the practice of his profession. From that time he was identified with the principal dentists of the state of Illinois, and in Alton was looked up to by all his colleagues. He believed in organization among dentists, and was active in his efforts to form and maintain societies. He was the founder and first president of the Southern Illinois Dental Society, and had filled the offices of president, vice-president, secretary, and treasurer of the Illinois State Dental Society. He was a life member and a member of the executive board of that society; was a member of the Dental Protective Association, and was often a representative from Illinois to the American Dental Association and also to various international meetings of the profession. During the term of Governor Fifer he was a member of the state examining board, being selected by the Illinois State Dental Society.

Dr. Rohland was a man of cultured mind and considerable literary attainment. He was a skilful musician, and could play the 'cello and organ. He was always faithful to his profession and worked hard in the interest of his patients. He had attended to the dental needs of many of the Alton people from childhood to middle life. He found time, however, to write many papers for dental societies, and also contributed chapters to dental text-books. His opinion on professional subjects was valued by men eminent in the profession.

As a man he was courteous, refined, and elegant, was devoid of ostentation, made warm personal friends, had not an enemy on earth, and might be termed one of the highest exponents of professional ethics.

He is survived by his wife, Mrs. Cora D. Rohland, and his daughter, Miss Constance. He has no other immediate relatives. He was a member of St. Paul's Episcopal Church, also of Belvidere Commandery, Knights Templar.

The funeral was held Friday, July 1st, at 3 o'clock, from St. Paul's Episcopal Church, Alton.

An informal meeting of the Madison County (Ill.) District Dental Society was held in the Illinois Hotel, Alton, Friday evening, July 1, 1910, immediately following the burial of Dr. Charles B. Rohland, and President Burroughs was requested to appoint a committee to express the sentiments of the society toward the deceased, resulting in the following tribute to his memory:

The very intimate relations existing between Dr. Charles B. Rohland and this society, he being its first president and chief organizer, make it most fitting that we record our appreciation of his wise counsel, his unusual abilities as a dentist, his great personal interest in this and other dental societies of which he was a member, his unselfishness, his pleasant smile and glad hand, and his possession of those mental and moral traits which make up a strong and lovable character; those attributes being such prominent features in his life that his "going out" leaves a vacancy that cannot be filled, and an influence that cannot be lost.

The beautiful flowers, wreathed by loving hands, that covered his grave on that July afternoon will soon wither and fade. Not so the tender memories wrought by our acquaintance and association with him, for the longer we knew the more we admired and loved this man, who in his professional and social life endeared and fastened himself to our hearts as with hooks of steel.

We extend our deepest sympathy to his widow and to his daughter, and commend them to "Him who doeth all things well."

A copy of the foregoing we forward to the family and to the dental journals, and record the same on our minutes.

T. W. PRITCHETT,
J. M. BARCUS,
W. E. HOLLAND,
Committee.

"IN MEMORIAM" RESOLUTIONS

Dr. William B. Mead.

THE following resolutions were passed by the Rhode Island Dental Society relative to the loss sustained in the death of Dr. Wm. B. Mead, who was one of the most prominent dentists of the state:

The members of the Rhode Island Dental Society announce with sorrow the death of Dr. William B. Mead, their oldest and one of their most beloved members.

Dr. Mead was a man of broad, sterling character; skilful and conscientious in his chosen field, and kind and sympathetic as a friend.

His exemplary life is an inspiration to young men entering the dental profession, and his absence from our meetings will indeed be sadly felt.

FORREST G. EDDY,
ARTHUR M. PORTER,
ALBERT L. MIDGLEY,
Committee.

Brief Necrology.

Dr. G. W. GRAY of Rutland, Ill., May 27, 1910, after a long illness.

Dr. C. H. O'CONNOR of Rhinelander, Wis., May 17, 1910, of apoplexy.

Dr. AUGUST GRAF of New York city, N. Y., July 3, 1910, in his sixty-fifth year.

Dr. WILLIAM SANFORD MURRAY of Lincoln, Nebr., May 11, 1910, after a long illness.

Dr. OSCAR ANGLEMAN of New Albany, Ind., May 12, 1910, in his twenty-second year.

Dr. W. H. BALLARD of Chebanse, Ill., June 22, 1910, in his fifty-sixth year, of apoplexy.

Dr. ALBERT H. BABCOCK of Brooklyn, N. Y., June 22, 1910. Deceased was one of the oldest dentists in America.

Dr. ALBERT J. SAWYER of Cambridge, Mass., March 18, 1910, in his seventy-first year, of pneumonia.

Dr. EMORY TOTTEN of Crawfordsville, Ind., July 12, 1910, in his seventy-sixth year, of old age.

Dr. W. C. NEUMAN of Plymouth, Wis., June 6, 1910, in his thirty-third year, of hemorrhage of the brain caused by seasickness.

Dr. J. H. SMITH of Little Rock, Ark., April 17, 1910, in his fifty-seventh year. Deceased was known as an artist, author, and inventor.

Dr. H. STANFORD BURTON of Oxford, Eng., June 25, 1910. Deceased was a graduate of the Dental Department of Harvard University.

Dr. MOSES WARD CARTER of Belleville, Ill., May 10, 1910, in his eighty-sixth year, of heart trouble. Deceased was a relative of Daniel Webster.

Dr. PHILIP S. HART of Chicago, Ill., June 20, 1910, in his thirty-sixth year. Deceased was a graduate of the Chicago College of Dental Surgery.

Dr. LOUIS STANFORD HYATT of Connellsville Pa., June 3, 1910, in his forty-fifth year. Deceased was a graduate of the Dental Department of the University of Pennsylvania.

Dr. ROSWELL O. STEBBINS of New York city, N. Y., May 24, 1910, in his fifty-sixth year, of Bright's disease. Deceased was an arctic explorer and traveler of note, and accompanied an expedition to Greenland in 1884.

SOCIETY NOTES AND ANNOUNCEMENTS.

NORTHEASTERN DENTAL ASSOCIATION.

THE sixteenth annual meeting of the Northeastern Dental Association will be held in Boston, Mass., at the Hotel Somerset, October 20 to 22, 1910. The essays, clinics, and exhibits promise a meeting well worth attending.

EDGAR O. KINSMAN, *Sec'y*,
Cambridge, Mass.

XI PSI PHI FRATERNITY.

NEW YORK ALUMNI ASSOCIATION.

THE annual fall meeting and election of officers of the New York Alumni Association, Xi Psi Phi Fraternity, will be held at Healy's, Columbus ave. and 66th st., New York city, at 8 P.M., Wednesday, October 12, 1910. Every Xi Psi Phi alumnus residing in or about New York city is urged and expected to be present.

J. N. GELSON, *Sec'y*,
Brooklyn, N. Y.

SOUTHERN ILLINOIS DENTAL SOCIETY.

THE Southern Illinois Dental Society is preparing to celebrate its twenty-fifth anniversary at Chester, Ill., October 25 and 26, 1910.

The Executive Committee are now at work on the program, and have promised to have the best in the history of the society. All members of the dental profession in Southern Illinois and all members in the surrounding territory are requested to remember the date, and so arrange that they may be in attendance. The program will be printed in due time, but at this early date we are safe in saying that there will be "something doing" all of the time.

OHIO STATE DENTAL SOCIETY.

NATIONAL MILLER MEMORIAL.

To the Dental Profession of America,—At the December 1909 meeting of the Ohio State Dental Society it was unanimously resolved that an American Memorial be established to perpetuate the memory of the late Dr. Willoughby D. Miller, as an evidence of the profession's appreciation of his laborious and fruitful researches for the scientific advance of dentistry.

From the consensus of opinion of various state and local societies, it was decided that the memorial take the form of a monument, to be erected in a suitable public place in Columbus, Ohio, the capital of Miller's native state. The monument is to consist of a life-size bronze of Dr. Miller, mounted upon a granite base of suitable proportions with appropriate tablets, the cost of which will approximate $8000.

* * * * *

Contributions are desired from individuals as well as societies; in fact, many small subscriptions are preferable to a few large ones.

The committee has selected Dr. Weston A. Price, 10406 Euclid ave., Cleveland, Ohio, to act as treasurer of this fund, and to him all subscriptions should be made payable.

* * * * *

Yours respectfully,
THE COMMITTEE.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE next meeting of the New Hampshire Board of Registration in Dentistry will be held from November 30 to December 2, 1910, at Masonic Banquet Hall, Manchester, N. H.

All persons desiring to practice dentistry are required to take an examination and become registered before beginning practice.

A. J. SAWYER, *Sec'y*,
Manchester, N. H.

ARMY DENTAL CORPS.

Memorandum of changes of stations and duties of contract dental surgeons, U. S. Army, for the week ending July 30, 1910:

Minot E. Scott, July 21st, left Vancouver Barracks, Wash., *en route* to San Francisco, Cal., for transportation to Manila, P. I.

Charles J. Long, July 27th, returned to Fort Adams, R. I., from temporary duty at Fort Rodman, Mass.

George I. Gunckel, July 26th, returned to Fort McPherson, Ga., from leave of absence.

For the week ending August 6th:

George E. Stallman, July 14th, ordered to proceed to the Leon Springs Target and Maneuver Reservation, Texas, for duty during the encampment.

Charles J. Long, July 31st, left Fort Adams, R. I., *en route* to Pine Camp, N. Y.

J. C. Whinnery, died at Zamboanga, Mindanao, P. I., July 29th.

For the week ending August 13th:

George H. Casaday, August 3d, relieved from duty at Presidio of Monterey, Cal., and will proceed from San Francisco, Cal., September 5th, to the Philippine Islands, for duty.

George D. Graham, August 3d, relieved from duty at Fort Leavenworth, Kans., and will proceed from San Francisco, Cal., September 5th, to Fort Shafter, for duty. Dental Surgeon Graham will stand relieved from duty at Fort Shafter about December 15th, and will then proceed to the Philippine Islands for duty.

George D. Graham, August 8th, granted ten days' leave of absence, August 20th.

R. E. Ingalls, August 2d, upon completion of duty at Fort Wingate, New Mex., will proceed to Forts Apache and Huachuca, Ariz., thence to Whipple Barracks, Ariz., for duty.

For the week ending August 20th:

George H. Casaday, August 9th, granted leave of absence for twenty days, to take effect about August 10th.

Alden Carpenter, returned to West Point, N. Y., from leave of absence.

Samuel H. Leslie, August 15th, ordered to proceed from his home, Monticello, Ark., to Fort Leavenworth, Kans., for duty at that post.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JULY 1910.

July 5.

No. 963,172, to Jacob Petry. Dental plate.

No. 963,418, to J. B. Buchanan. Dentist's flask.

No. 963,541, to Robert Galloway. Artificial teeth.

No. 963,648, to Chas. W. Plumley. Artificial tooth and crown.

July 12.

No. 963,794, to John J. Moffitt. Dental waste-receiver.

July 19.

No. 964,526, to A. S. Knapp. Tweezers.

No. 964,950, to A. A. Allinger. Syringe.

No. 965,079, to H. E. Caswell. Mouth speculum.

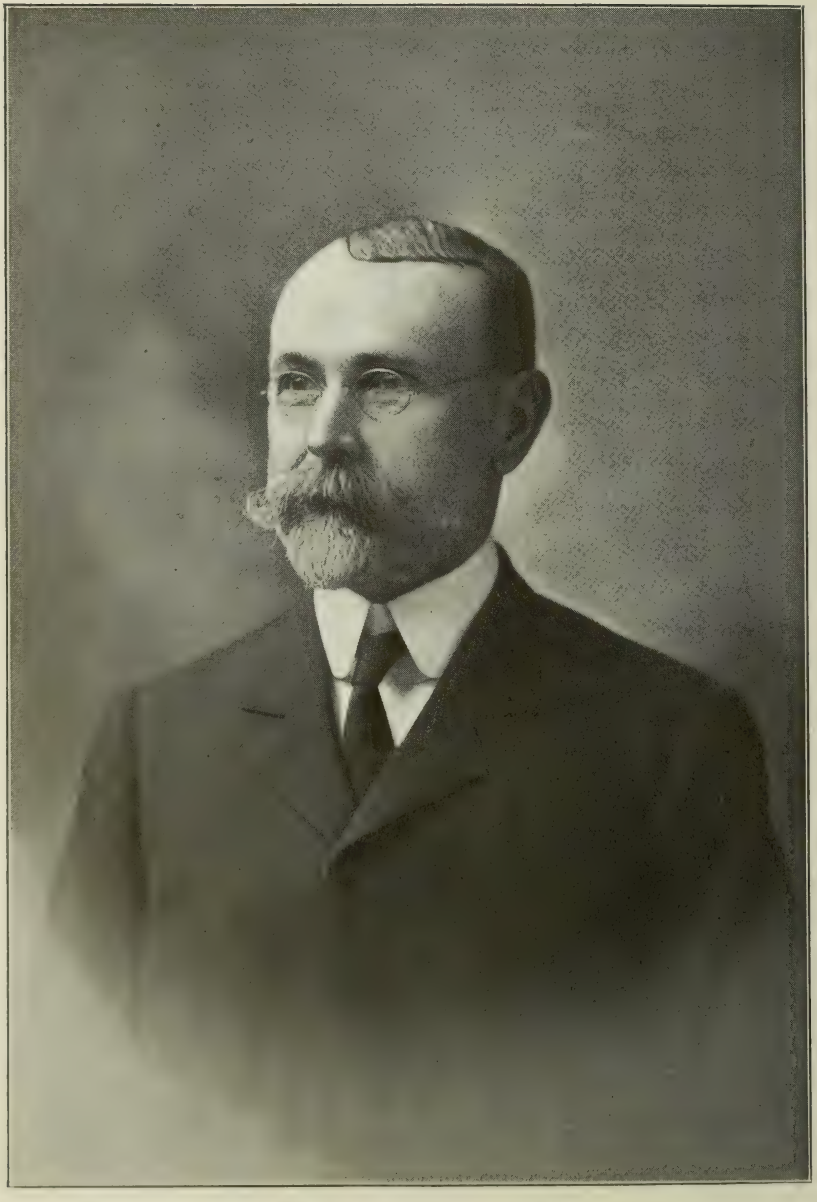
July 26.

No. 965,246, to George E. Stallman. Tooth.

No. 965,266, to Friedrich A. Wienand. Artificial teeth.

No. 965,267, to Friedrich A. Wienand. Composition for use in burning artificial teeth.

No. 965,309, to F. L. MacDonald. Fountain tooth-brush.



DR. BASIL M. WILKERSON.

THE

DENTAL COSMOS.

VOL. LII. OCTOBER 1910. No. 10.

ORIGINAL COMMUNICATIONS.

THE FUNCTION OF THE TEETH IN THE DEVELOPMENT OF THE FACE.

By C. A. HAWLEY, D.D.S., Washington, D. C.

ANNUAL ESSAY.

(Read before the District of Columbia Dental Society, June 21, 1910.)

THE subject of this essay has been selected for its importance as contributory to the great movement going on within the dental profession and among the people, during the last year especially, looking toward a real recognition of the value of the human teeth.

This movement marks an awakening of the profession to their duty in the education of the public, and at the same time an awakening of the public to the realization of the value of the teeth and their use as a means of preserving health and strength. Without going into detail, I would mention as contributing to this movement the wide reading and acceptance of the teachings of Horace Fletcher and the statements of such men of authority as Dr. William Osler and the Surgeon-general of the Navy, with many other similar writings. The demand for the services of dentists in the past has been based too much on the necessity of relief from pain and suffering caused by neglect of the teeth. While this preservation and care is most essential, as shown by the fact that it is today engaging the exclusive services of more men than the care of any other organ or set of organs in the human body, yet when their full value is really known and understood, the recognition of the dignity and usefulness of our profession in the development of the human race toward perfection will be excelled by no other.

In furtherance of these ends I wish to stimulate your appreciation of the value of the teeth in the human economy by engaging your attention in the consideration of a function of these organs which is of supreme importance but which until recently has not been fully recognized.

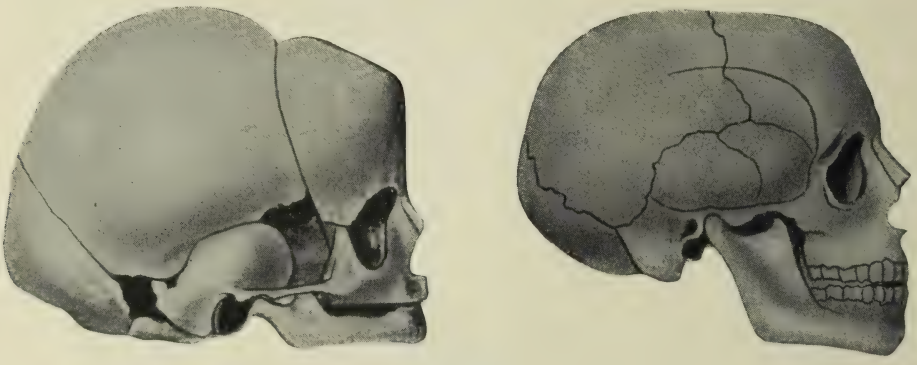
This function, when the teeth are preserved in a fully developed normal denture, is exercised in the development and maintenance of the normal expression of the face, and of normal nasal spaces with fully developed facial bones and accompanying sinuses. This may include the hard structures surrounding the eyes,

and, in short, all the bony framework of the face.

In presenting this subject I wish to first call your attention to the growth of the bony parts of the face from birth to maturity as shown in Fig. 1 (from an illustration used by Dr. Ferris of Brooklyn). The skull on the left is that of a child, and the one on the right that of an adult. The proportion of development in the two skulls forward of the occipital condyles is in about the ratio of 3:5. The development downward in the dental region is readily noted. This development includes the maxillary bones and the mandible, with the alveolar process.

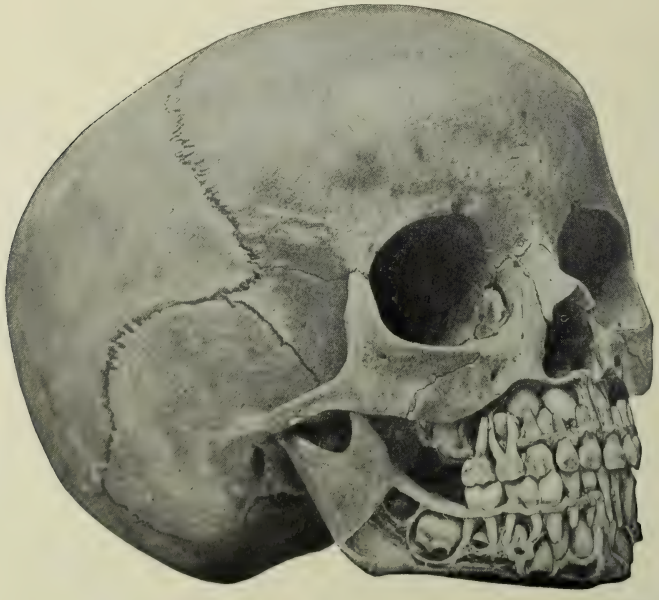
In Fig. 2 (from Cryer), illustrating

Fig. 1.



Showing growth of the dental arches from infancy to full development.

Fig. 2.



—*Cryer.*

Skull of child at about the sixth year, showing the proportion of the entire bony structure occupied by the developing teeth and their supporting structure.

the skull of a child at about six years of age, we can see what part of this structure is occupied by the developing teeth, and the consequent dependence of this growth upon them.

In Fig. 3 (from Cryer), I wish to call your attention to the firm insertion of the teeth in the alveolar process. They are seen to be deeply inserted in the cancellous portion, which is overlaid and strengthened by the firm cortical layer on the outside. Consider in this connection the possibility of moving these bones entire by means of the firmly inserted teeth when acted upon as levers by artificial appliances.

If we look at the outside of the skull, we notice the maxillary bones, situated beneath the anterior fossæ of the brain-case, rather loosely attached by means of the nasal bones, and through the center the vomer and ethmoid, which form the nasal septum. At the posterior portion of the upper surface it is attached by means of the sphenoid. Laterally the upper jaw is supported through the malar bones by the external angular processes of the frontal bone and by the temporal bones at the sides of the skull, through the zygomatic arches.

In the center, as shown by the next illustration (Fig. 4), the maxillary bones are divided by a central suture. These bones, situated and distributed as they are, afford great support to forces acting externally in an inward direction, and

Fig. 3.



—*Cryer.*

Dissection illustrating the firm insertion of the teeth in the alveolar process.

dissipate and diffuse shocks which would otherwise be transmitted to the brain-case, but, as noted by Dr. Cryer, "On account of this construction, but little force is necessary to detach the upper jaw from the cranium," or, we might add, to spread it laterally by a force acting from within.

Fig. 4.



Skulls showing the maxillary suture, and also, on the right, a normal dental arch with large posterior nares; on the left, a narrow dental arch with small nares.

Fig. 5.



—*Cryer.*

Section of head in the region of the first molar, showing the relations of the dental arch and the facial bones.

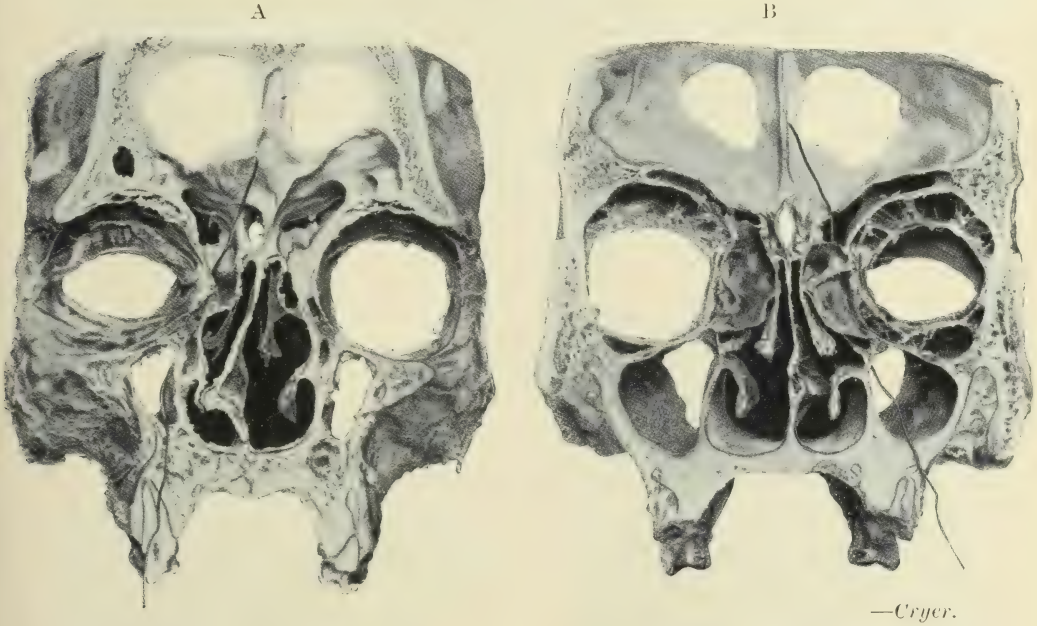
The relations of the dental arch and the facial bones are further shown in Fig. 5 (from Cryer), being a section of the head in the region of the first molar

viewed from the front. The dental arch in this case is nearly normal. In the next illustration (Fig. 6) sections of the skull by Cryer are shown in which the dental arches are narrow, and in which also the nasal passages are narrowed and obstructed.

In summing up the results of his extensive dissections of the head, Dr. Cryer says: "In former papers upon variations a pronounced deflection in the nasal septum was invariably accompanied by irregularity of the teeth."

If there is a constant relation between the dental arches and the development of the surrounding bones as indicated by their anatomical structure and relations, then it is evident how any loss of the deciduous teeth, or any condition that interferes with their normal growth, is

FIG. 6.



—*Cryer.*

Sections of skulls in which the dental arches are narrow, showing narrowed and obstructed nasal passages.

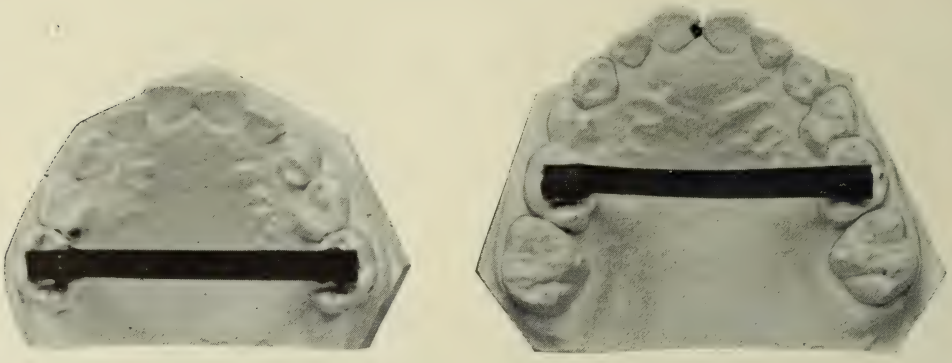
of the maxillary bones and their adjacent parts, an endeavor was made to show that there is a quite constant anatomical law, that when the mouth, palate, and dental arches are bilaterally symmetrical with properly occluding teeth, the other structures of the face will exhibit a like condition. . . . Malocclusion will certainly modify the shape of the mouth, and this modification will have an important bearing on the face."

Dr. E. A. Bogue of New York, after spending a week in examining the skulls in the Army and Navy Medical Museum, says: "In all the skulls that I examined likely to have a deleterious effect on the internal structure of the face. I scarcely need dwell on the causes of malocclusion in so far as it is caused by neglect, disease, loss of deciduous teeth, or lack of development from non-use. These features have been fully discussed by others. There is another cause of malocclusion to which I wish to call your attention that in this climate enters into at least seventy-five per cent. of the cases. This cause is the obstruction of the nasal passages or throat, and consequent mouth-breathing.

The direct effect of this condition is

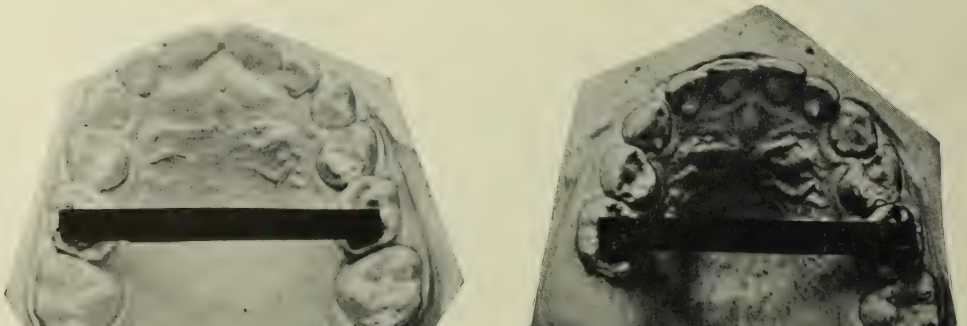
to cause the dropping of the tongue from the vault, releasing the upper teeth from its support, and also to cause a drawing inward of the muscles of the cheeks. A more potent factor in such cases is what appears to be an arrested growth of the surrounding parts which precedes and is distinct from the mechanical effect on the teeth. The absence of the tonic effect of the air in nasal tissues causes an arrest of their growth and development, following the natural law of disuse which applies to any organ of the body. This condition is in many cases present even when the obstructions are removed early and nasal breathing is partially or completely restored. It is possible and probable that this is not so much a causative factor in malocclusion, as stated above, as an accompanying condition, and that both have their causes lying deeper, in a general lack of development from unexercised functions of the teeth through many generations. Never-

FIG. 7.



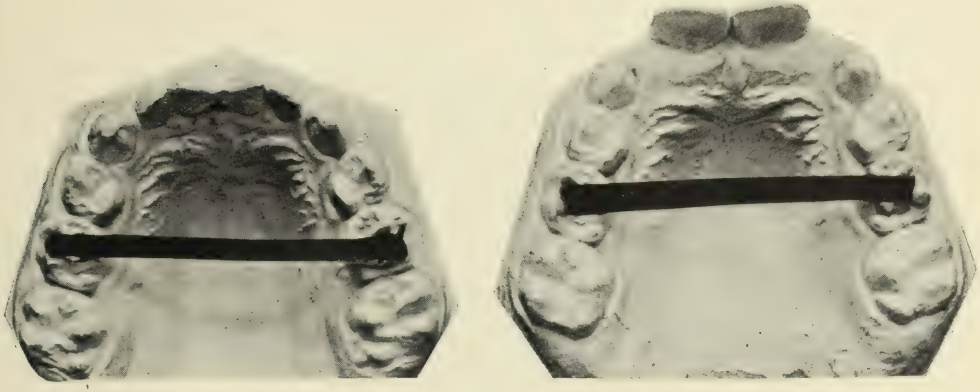
The cast on the left was taken at the age of four. Adenoids were removed a month later. The cast on the right was taken at the age of seven. There had been absolutely no lateral growth and the child was still a partial mouth-breather.

FIG. 8.



The cast on the right was taken at the age of six. Adenoids were removed three years previous. The cast on the left was taken at the age of eight. There had been no lateral growth.

FIG. 9.



The cast on the left was taken at the age of six. Adenoids had been previously removed. Cast on the right at the age of eight. A growth of only about 2/100 of an inch had taken place. Amount of lateral widening necessary to produce normal arch, 36/100 of an inch.

FIG. 10.



Casts of child taken at the ages of five, eight, and ten. Very small growth, about 2/100 of an inch. Amount necessary to form a normal arch, 20/100. A normal breather with no nasal obstructions.

theless, its complete relief is only possible through orthodontic treatment.

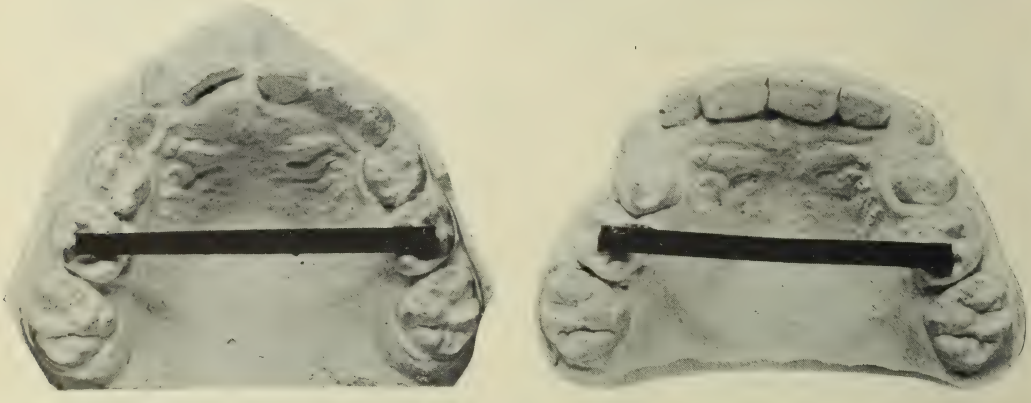
PERSISTING ARREST OF GROWTH.

I have many cases on record where, notwithstanding an early operation for the removal of adenoids, there was present an arrest of growth shown by the characteristic narrow arch, on the eruption of the permanent teeth. It has been noted by Kyle and other writers on diseases of the nose and throat that, unless the obstructions to the nasal passages were removed before the seventh year, there would be such a hardening of the cartilaginous tissues and bony parts of that region that there could be little further growth of these parts, and the subject would always be a mouth-breather.

Evidence gathered in the practice of orthodontia shows the truth of this statement, and further, that where the conditions obtain that produce malocclusion and nasal or throat obstruction, the atrophy of the bones of this region will not be relieved by the removal of the soft obstruction even at an early age. In the teeth we have a means of accurate observation of this lack of growth which has not been obtained elsewhere. It has been well established by Cryer and others, as before mentioned, that their condition as regards normality and that of the maxillary bones is practically identical.

In regard to this atrophy of the tissues or arrest of growth in the maxillary bones of children I wish to digress for a moment and to present five cases selected from my own collection. The first three of these cases had undergone operations for adenoids either at the time when the first models were made or previous thereto. (See Figs. 7–11.) The last three patients were comparatively normal breathers. Strips of black paper of exactly the same length were pasted across the arch on the second deciduous molars.

FIG. 11.



Casts of child at the ages of six and ten. No adenoids or nasal or throat obstructions. Very little growth.

These cases show an arrest of development, and indicate also that the child's denture does not grow laterally, but is pushed forward and downward bodily by the growth of the permanent molars and maxillary bones. There are a number of facts that point strongly to this conclusion—which, if true, is directly contrary to ideas generally prevailing on this subject. In the last edition of his book, "Malocclusion of the Teeth," Dr. Angle, in speaking of the permanent first molars, says: "Naturally the arch is narrower between these teeth when they first erupt than at the time when the denture is completed, as must follow the normal growth of the jaws and other bones.

Lack of recognition of these facts has led to the erroneous belief by many that the upper arch should usually be widened in the region of the first molar, even in the cases of young children."

If the conclusions indicated by the cases shown be found true, viz, that the deciduous denture in growth is pushed downward and forward, and not expanded laterally, then the position held by Dr. Angle will be found untenable, and the sooner a child is treated, after an undeveloped condition is diagnosed, the better for the child.

It is in such cases that orthodontic operations promise relief. The results gained by these operations are difficult to explain as the result of the mere mechanical movement of the teeth. Besides the actual mechanical effect there seems to be a stimulation of growth which is very marked. This stimulation of the vital processes is shown in the ready and normal shedding of the deciduous teeth, which depends largely upon the vascularity of the pulps and surrounding tissues. While this vascularity should be stimulated and increased normally by their full use in mastication, it is also increased by tooth movement. In those cases where the nasal spaces have been cleared by surgical operations a year or two years before, with failure to establish nasal respiration, normal breathing is usually almost unconsciously resumed a few months after the adjustment of orthodontic appliances. This fact has been observed by so many orthodontists that it can be considered as well established. The fact that the benefits gained in respiration and in facial expression often seem altogether out of proportion to the actual mechanical movement, and that this improvement is sometimes marked where the mechanical movement is very moderate, seems to indicate that much of the result is gained by stimulation and renewed growth in a semi-atrophied tissue. While it is probable that most of our results are obtained by this process, we must admit, as indicated by the anatomical structure previously pointed out, that there is a possibility of the movement of the maxillary bones entire, either in a forward direction or laterally by a separation of the palatal bones. The stable attachment of modern orthodontia appliances on the teeth, with their leverage on the surrounding bones, seems amply sufficient for this effect, and is only the means of producing such movement. The fact of the separation of the palatal bones is well known, and an apparatus was presented by Dr. R. Ottolengui of New York at the Fourth International Congress at St. Louis, designed for that purpose. There is a possibility also of moving the mandible forward at the temporo-maxillary articulation. Just what occurs when the occlusion is shifted from distal to normal is not definitely known, and it is not necessary for the purposes of this paper to discuss that subject.

FACIAL RESULTS FROM DENTAL CORRECTION.

In illustration of the foregoing argument I wish to present a few cases, selected with a view of following typical development of the face from correction of malocclusion of the teeth. [As these cases were taken from private collections only two of them (Figs. 12–15 and 16–19) can here be shown.]

In presenting this subject from the orthodontist's standpoint, I do not wish to be understood as intimating in any way that this treatment can take the place of surgical procedures for removal of abnormal growths of the nose or throat. On the other hand, orthodontia emphasizes their importance and begins where they leave off. It offers relief for conditions in which surgical treatment is practically helpless, viz, occlusion of the teeth, development of the bony structure, vocalization, and the natural harmony of the features.

One question that confronts us in considering the development of maxillary bones and the face is as to how extensive may movements be made. The limit to movement is prescribed, first, by the restoration of normal occlusion, and second, by the restoration of the normal form of the arch, as indicated by the size of the

teeth. As to the former, I need not do more than refresh your minds by views

Fig. 12.



Fig. 13.



Fig. 14.



Fig. 15.



of these skulls (Figs. 20 and 21). In each the occlusion is normal. If we examine their occlusal aspect (Fig. 4), we find one exactly normal and the other considerably contracted, illustrating the importance of the form of the arch as

well as the occlusion of the teeth, for we can also notice, in the one with the normal arch, full, well-developed posterior nares, while in the other the posterior nares are narrow. As to the form of the arch, the principles for its determination

Fig. 16.



Fig. 17.



Fig. 18.



Fig. 19.



were laid down by Dr. Bonwill fifty years ago in his observations on the form of

Fig. 20.



Fig. 21.

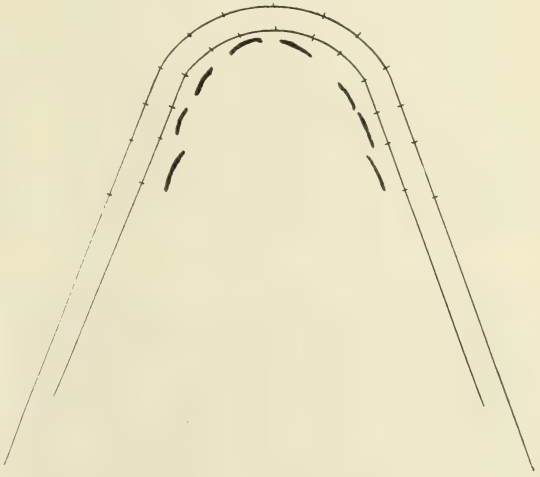


the arch, and on the movement of the lower jaw in mastication. As his determinations were not arbitrary, but based upon extensive examinations of natural dentures that were nearest perfect, we may presume that there is something in the forces acting in the movement of the jaw in mastication which, if undisturbed, will form this arch. While Dr. Bonwill described the normal arch and the movement of the mandible in mastication, and laid down methods for their use in the construction of artificial dentures, yet he left no method for its use in orthodontia. The writer described a method of determining the normal arch in orthodontia in a paper read before the Fourth International Congress in 1904. One result of this work was a set of charts which comprehend in their limits all the variations in the sizes of the teeth. These charts for convenience are printed on celluloid, in order that they may be placed over the model and the movements of the teeth studied.

Taking the smallest and the largest of these arches, and placing them over an outline of the smallest upper model I have in my collection, we have approximately the range of the possible movement of the teeth. (See Fig. 22.) While these arches are approximate, and may be exceeded or limited for artistic effect, or for effect on the nasal passages, yet it must ever be kept in mind that the use of teeth in mastication and their preservation in after-life should not be subservient to supposed esthetic effect, at least until more definite principles are set forth on that subject than have been up to the present. We must place the teeth in the occlusal form in which nature intended them to be for this perfect use, and presume that nature has not been greatly in error in presenting to each individual the size of teeth best suited to his physical development.

In this connection I might suggest that we have in the teeth, with the help of the charts, a possible standard for the development of the nasal tract. The teeth are the only organs in this region whose arrangement will admit of an exact geometrical law, established and compelled under natural conditions by the muscular movement of the lower jaw in mastication, and their arrangement and the condition of the bones of the nasal tract is closely interdependent. Their normal development is as important to the individual as the air and the food which enter these orifices are to his normal life.

FIG. 22.



The largest and smallest charts placed over an outline of the teeth in the smallest upper model in the writer's collection, showing the approximate range of possible movement of the teeth.

In closing, I must say that while these observations on the function of the teeth in the development of the face have been in a way incidental to the routine practice of orthodontia, yet they impress most strongly upon us the supreme importance and value of the teeth, not only as organs given us by nature for the mastication of food, but as organs upon whose preservation in proper form and occlusion depends the development of the nasal passages, with the vital function of proper breathing, and the preservation of the beauty and the strength of the face.

TRUE ART IN DENTAL PROSTHETICS.

By NORMAN S. ESSIG, D.D.S., Philadelphia, Pa.

(Read before the Connecticut Dental Association, at its annual meeting, at New Haven, Conn., April 20, 1910.)

I SHALL endeavor to bring before you this morning a subject that has interested me for a number of years, and to which I have given much time and attention. What I have to say may be considered a plea for better prosthetic dentistry, with a description of a few efforts on my part toward the truly artistic in dental prosthetics. That there is a growing interest in this important field is evident, and much of the so-called artistic work which we have seen is a step in the right direction.

We are living in an era of imitation. There is hardly anything that is not imitated, and often so closely that the imitation is hardly discernible from the genuine article. For instance, fabrics of all kinds, wood, ivory, etc., all manufactured goods, are so closely imitated that it is impossible to detect them without appropriate physical tests, and there is no reason why we, as prosthetists, should not bring our imitations to the same state of perfection.

That I may be better able to convey to you the ideas I have in mind on this subject, I will pass around the few specimens I have brought with me, and you will observe that they are very close imitations. I have placed the porcelain imitations alongside the natural teeth for comparison. The first specimen is a set of six anterior teeth, in which one of the centrals has been taken out, and the imitation put in its place. (See Fig. 1.) Next, a set of four anterior teeth, two natural and two artificial, of which the right central and the right lateral are the imitations. (Fig. 2.)

FIG. 1.

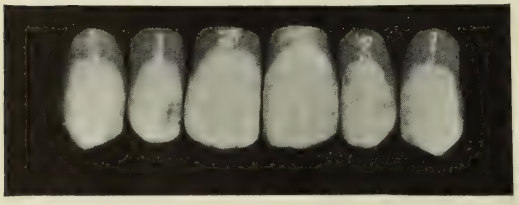
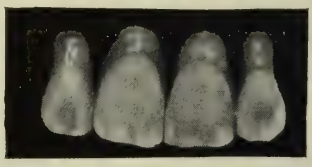


FIG. 2.

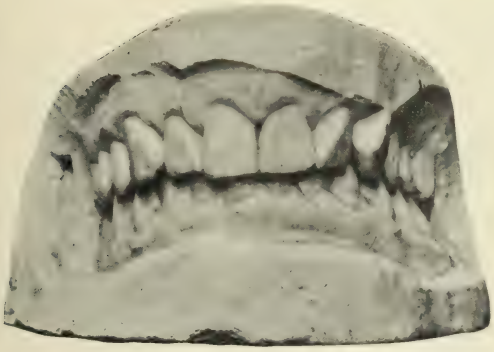


We should realize that the duty of the prosthetist to his patient is not the mere replacement of the teeth that are lost; we owe more than that to our patients, for it lies within our capabilities oftentimes to give them, not only a denture that will serve to properly masticate food, but something that will fill out to normal contour the portion of the cheek which falls on account of the loss of teeth, and to restore the facial expression, or even improve it—something that when adjusted does not attract attention nor proclaim itself as artificial.

My method is to prepare a model to be used as a record, to which I can refer

in the future if there is a change from premature loosening, accident, or structural breakdown. (Fig. 3.) I secure this model of the mouth by getting the patient to close the teeth, and then firmly pressing a piece of modeling compound or wax against the upper and lower anterior teeth, from which impression I run out my model. This gives me a record which I file away with the name and any notes that may seem necessary at the time. I thus have a record which is absolutely accurate and can be referred to in connection with the impression taken later for the piece itself. (Fig. 4.)

Fig. 3.



Some years ago a young man, a recent graduate, came to me for instructions, asking for a few hints in prosthetic work which might be considered the legitimate short cuts, that would be of value to him in the course of his dental practice, and among other things I got him to reproduce his own mouth. The young man had had no experience; as a matter of fact, he had just received his degree. He has very kindly sent me the pieces for your inspection. (Fig. 5.) This shows very clearly that even though one has not had great experience, if shown the proper technique it is quite possible to produce very artistic results. This is a piece of work I should be proud of, were I the author of it.

Much has been said and written with regard to artistic prosthetic work, and I think that all efforts in that direction are a step forward, although, thus far, we are not near the exact reproductions of the natural teeth. The dental depots are making what they call artistic teeth, but they are inadequate and open to much criticism. We cannot, however, expect the dental depot to carry a stock of teeth to suit every case presented to us, therefore we must consider their stock only as our raw materials. At this point, we cannot deplore too strongly the passing of the straight-pin tooth. Cross-pin teeth are much more numerous, having almost supplanted the straight-pin teeth, until it is next to impossible at the present time to find an assortment of those having straight pins varied enough to select from. We find particularly long

Fig. 4.

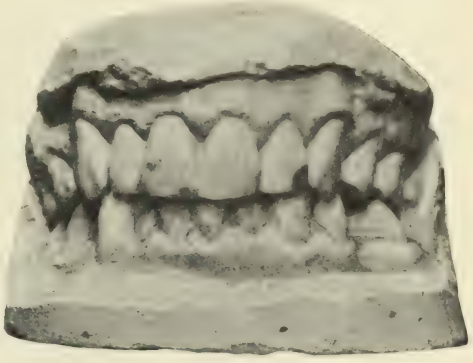
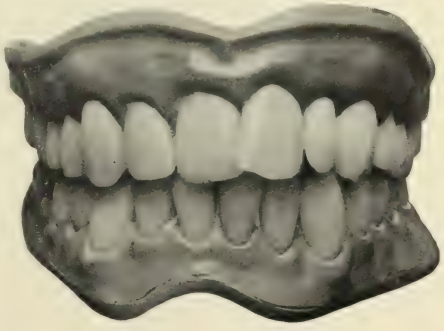
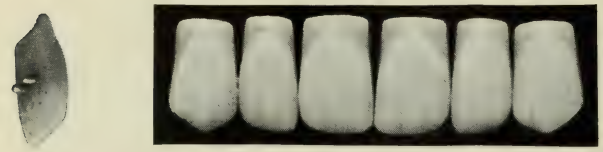


Fig. 5.



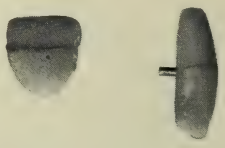
teeth at the present time with cross pins. (Fig. 6, *a, b.*) This is contrary to the old teachings. We used to be taught that we should not use cross-pin teeth, except in instances where the space is so small and the bite so close that we could not use anything else. I have here a facing

Fig. 6.



a *b*

Fig. 7.



a *b*

from a crown which cracked in the mouth and came away three or four times, each time being broken directly across the pins. My patient asked why this happened so often, rather censuring me for it. (See Fig. 7, *a.*) I took from my case a cross-pin tooth with plenty of structure,

but in the majority of instances, if we have plenty of material, we can make anything our case demands of us. We are not always able to do our best or to adhere strictly to the standard we have set for ourselves, for the reason that we cannot get the "raw materials." I have

Fig. 8.



struck it lightly with an instrument, causing it to break directly across the pins, as you see. (See Fig. 7, *b.*) I explained to her the reason, which had no particular meaning to her until I took a straight-pin tooth and struck it in the same manner, without being able to break it. So I cannot refrain at this time, when we have so many dentists present, and also representatives of some

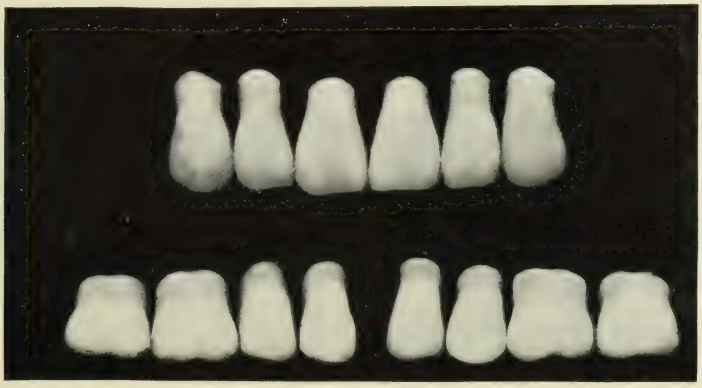
here a set of fourteen teeth of a large mold; unfortunately, this mold is not to be had now. (See Fig. 8.) This set I have gone over according to my idea of what the natural teeth should be at about the time when the average person requires an artificial denture. (See Fig. 9.) The teeth in Fig. 8 are of a size and form, as I said before, not easy to obtain now, and in anticipation of such

difficulties I learned mold-making; I made this mold myself (Fig. 9), and can duplicate it at any time that I find it necessary to use them.

Returning to the question of the record models, there is another feature in connection with this method which has always been interesting to me, and which from the standpoint of remuneration, as well as the artistic, I hope will interest you. Sooner or later the patient will require the replacement of a single tooth or more, and if he knows that his dentist has safely filed away the model of his mouth as it was, he will go to him rather than anyone else to have the work done, as it is reasonable to suppose that he can replace them better than the new man who has never seen the natural teeth.

In many instances, the impression taken at the time of the making of the denture has to be mutilated, especially if it be a rubber piece. In case it be a metallic piece the model is not marred to the same extent. To make my meaning clear, I will describe a case in my practice, with my method of procedure. A woman who had been a patient for a number of years, and for whom I had prepared a record model at the first sign of pyorrheal disturbance, in the course of events was forced to lose the six anterior teeth in the upper mouth, having lost several other teeth earlier in life. I had carried the case along to this point, preparing her step by step for the loss that was sure to follow. The lady was very prominent socially, and in almost every other way that a woman can be prominent, besides being a very handsome woman, with consequently a just cause for some vanity. She could not afford the time for seclusion after the extraction of the teeth, and it therefore became necessary to arrange matters without having her retire from her duties for the period of time required, and also to avoid a shock to her and her friends. I ligated all the loose teeth with a fine linen thread, and took an impression, from which I made a model. A fine saw was then passed between the teeth on the model and each one broken off carefully, retaining the plaster teeth, or in other words, the portion of the plaster teeth which was characteristic. I laid them carefully in front of me and carved the model to imitate a mouth from which the teeth had been freshly extracted. After that was done, I took the teeth I had broken off the model and reproduced in porcelain each and every one of these in detail and stained them to faithfully reproduce the natural teeth. My record was then used to obtain the arrangement of the teeth, after which the piece was finished, and on a given day she had the teeth extracted, and in fifteen minutes after she had the last loose tooth removed I put the plate in her mouth. This required some courage, be-

FIG. 9.



cause the entire scheme would have failed had there been any discrepancy in carving the model. She went, however, in a few minutes to her club, eating her luncheon without difficulty, and the effect was so natural that her husband did not know for a year that there had been any change in her mouth. At the end of that time I found it necessary to compensate for some shrinkage, and was asked if two wrinkles in her face could be removed. I informed her that it could be done. Then she wanted to know if they could be replaced if their removal should make her appearance unnatural.

Fig. 10.

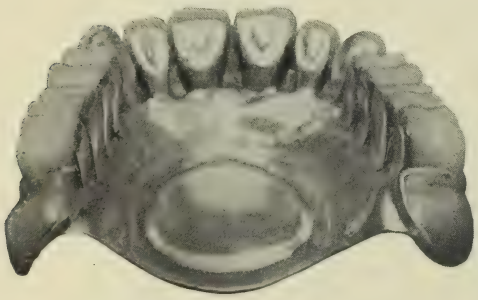
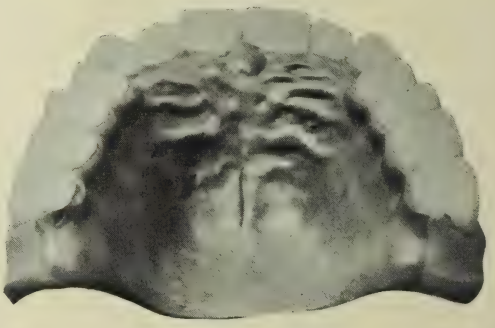


Fig. 11.



She concluded to have the wrinkles removed, and this was done by thickening the plate at the required spot. When she went home her husband thought her face was slightly swollen, and asked her if she did not have the toothache. She then confessed that she had had all of her teeth taken out. I have always thought that it would have been as well if she had kept up the deception, and had the wrinkles replaced without saying any more about it than was necessary. However, she said that her sister, who was abroad at the time, would soon return, and if there was anything noticeable about her mouth she would be sure to observe it, she having been away for two years. She came to my office afterward and told me that her sister's attention had not been directed to the mouth, and we believe that she also was deceived, so that her entire family, with the exception of her husband, knows nothing of any change in her mouth to this day.

This method, together with the close imitation of the natural organs, shows that it is not necessary to subject our patients or their friends to a shock, either before or after the piece is made.

There is another feature that appeals to me as a factor of the truly artistic in prosthetic dentistry. It is not sufficient, to my mind, that we replace the natural organs by artificial dentures or bridge work. We should construct a piece that is not only pleasant to the tongue, but that will restore as fully as possible the masticating function, the controlling of the food bolus in the mouth by the tongue, and furnish the self-cleansing spaces that add so greatly to the general comfort of the mouth; in fact, everything should be done to render the mouth as comfortable as possible. A denture, especially a rubber one, with smooth surfaces over which the tongue slips, surfaces that do not tend to control the food at all, makes it extremely difficult for the patient either to become comfortable or proficient in its use. I have had patients ask me if I could not roughen the plate, that it was so smooth they noticed it all the time, and it made bread feel like cotton-wool in the mouth. Therefore the application of the rugæ on all dentures is an important feature, and instead of giving to the tongue side of the denture a perfectly smooth surface, the rugæ should be restored, giving

it a somewhat irregular surface, which relieves the conditions to which I allude, besides improving articulate speech.

The lingual aspect of the teeth themselves is also an important one. They should present a rounded surface. This can be done in several ways. The metal plate is the one in which this feature is most neglected. Teeth for vulcanite attachment are larger and give more rounded surfaces; however, rubber is not always indicated.

Here is a gold denture with rubber attachment. (Fig. 10.) The teeth are attached by means of solder, and the lingual surfaces are built out, which gives the patient a feeling of comfort never experienced by a flat backing, for if the tongue comes in contact with a perfectly smooth surface the patient is conscious of the condition at all times, and much time is required before one can become accustomed to the unnatural condition and is able to forget the presence of the denture. The rugæ and rounding up of the lingual aspect is shown in Fig. 11, or as nearly as it can be obtained with the artificial teeth made at present.

This full upper and lower denture (Fig. 12) was made during the time that Dr. Chas. J. Essig was professor of prosthetic dentistry in the University of Pennsylvania, as a technical piece.

Fig. 12.

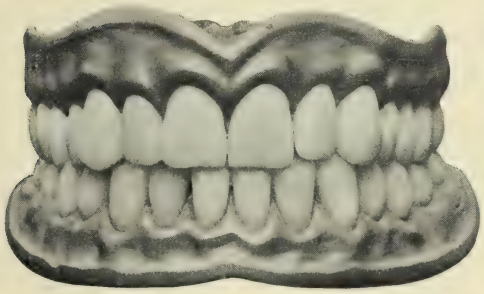
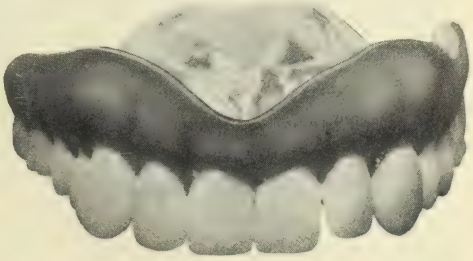


Fig. 13.



The next specimen (Fig. 13) is one that was worn for five or six years, and I do not exhibit it as a specimen of porcelain or continuous-gum work. It is noticeable that the plate was broken and no care taken in mending it, and it was never worn afterward. The arrangement of the teeth, however, and the character of their surface, is to my mind cleverly wrought. This was done by adding ordinary continuous-gum body to the teeth, which after being burned was polished with a sandpaper disk, followed by a piece of wood armed with oxid of tin to finish.

Fig. 14.

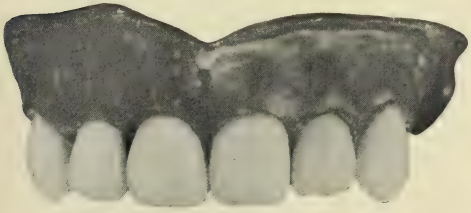
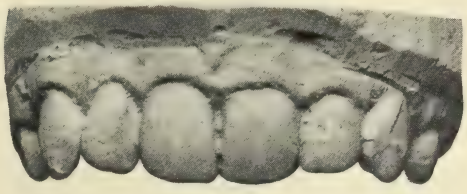


Fig. 15.



I present here a model representing the case of a lady who was edentulous. When she came to me for a denture she brought her daughter, whose mouth, she

said, was like her own at the same age. She wanted a plate with the teeth and arrangement similar to her daughter's. I took an impression of the daughter's mouth and made the denture according

Fig. 16.

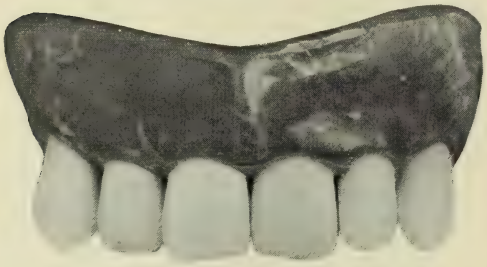
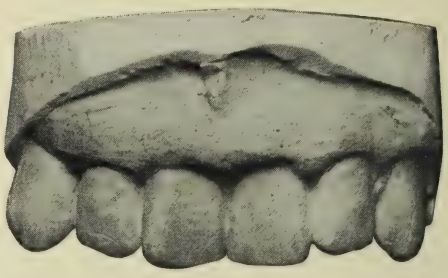


Fig. 17.



to this record model. (See Figs. 14 and 15.)

A similar case is represented in Figs. 16 and 17.

With regard to the form of porcelain teeth: From what I know of mold-making, there seems to be too much

Fig. 18.

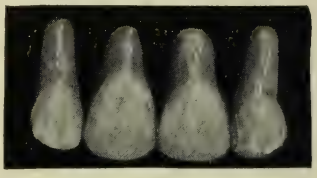


trimming of the tooth as it comes from the mold.

There is a great deal less difference between pairs of centrals, laterals, or canines than there is in the pairs of natural teeth as we find them in the mouths of young adults, and if the dental manufacturing companies would leave their teeth more irregular and allow the lines made by the mold to remain, they would round out in the process of burning and the result would be much more artistic, and they would also be far easier to adapt to any given case.

In remodeling porcelain teeth, it is always my plan to take the largest molds I can get and cut them down, making from them as nearly as possible what I desire. (See Figs. 18 and 19.)

Fig. 19.



The various points to which I have endeavored to direct your attention can be better understood by a careful inspection of the specimens than by further verbal description, but I shall be only too glad to make clear any points which may require further explanation.

THE RELATION OF THE DISEASES OF THE NOSE AND PHARYNX TO DENTISTRY.

By Dr. H. A. ENGELHARDT, Houston, Texas.

(Read before the Southern Branch of the National Dental Association, at Houston, Texas, May 4, 1910.)

THE perfect health and comfort of every individual being depends largely upon sufficient breathing-space. My observation leads me to believe that a great many of the ills in life might be materially lessened by a more thorough knowledge of the physiological functions of the organs of the body.

In this article I shall endeavor to demonstrate the frequent and dangerous sequelæ which follow the diseases of the nose and pharynx. A short description of the anatomy and the physiological functions of these parts may help to give a clearer idea.

ANATOMY OF THE NOSE AND PHARYNX.

The nose is anatomically divided into two parts—external and internal. The external part consists of the nasal bone and the nasal process of the maxilla, and of cartilaginous framework. The integument adheres loosely to the bony but very firmly to the cartilaginous parts. Internally, the nose is divided by the septum into two irregular cavities, the nasal fossæ. They open in front by the two anterior nares, and terminate behind the pharynx by the posterior nares. The roof of each fossa is formed by the cribriform plate of the ethmoid, the floor being formed by the horizontal or palate process of the maxilla and the palate bones. The three turbinates divide these fossæ into the superior and the middle and inferior meatus. The superior and middle turbinates arise from and form part of the ethmoid, the inferior turbinate springing from the maxilla.

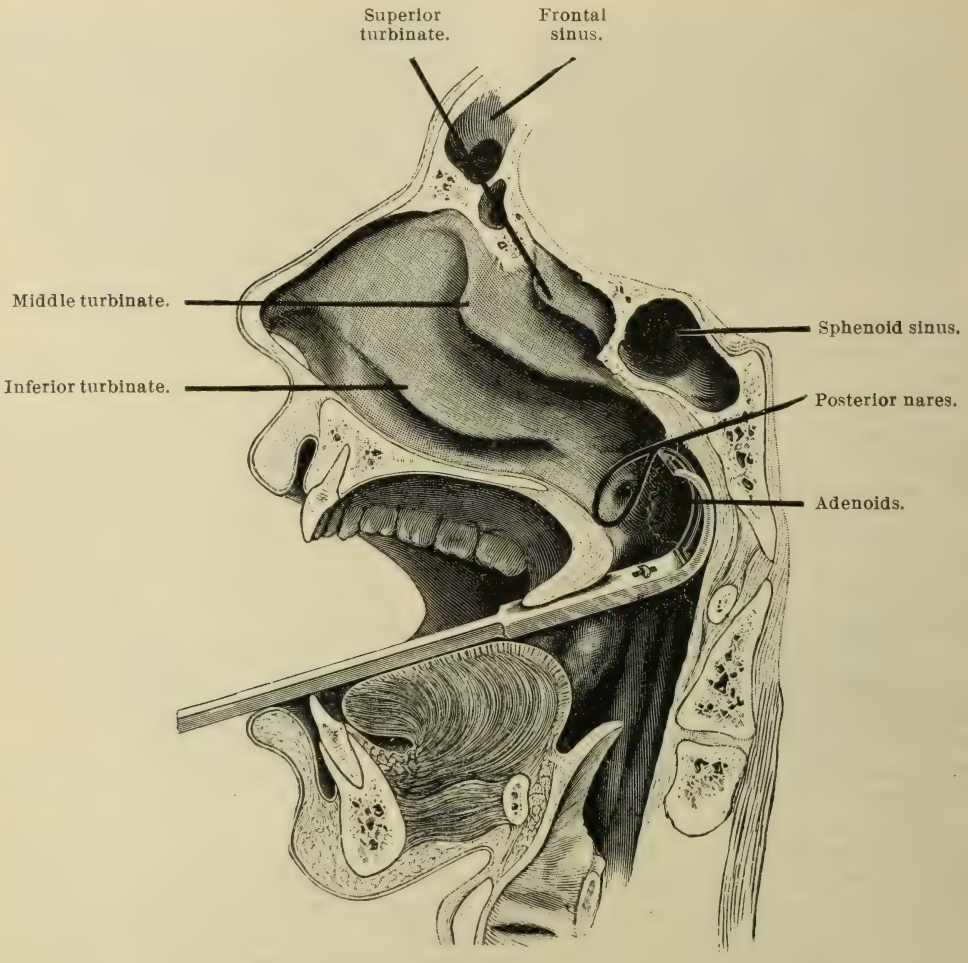
The pharynx is situated behind the nose, mouth, and larynx. It is about four and one-half inches in length, and is subdivided into the naso-pharynx, or upper part, which terminates at the level of the palate; the oro-pharynx, or middle portion, which extends to the vestibule of the larynx; and the laryngo-pharynx or lowest portion, which opens into the esophagus at the lower border of the cricoid cartilage. The posterior nares open into the naso-pharynx. Here are found the "Luschka tonsils," more generally known as adenoids. The Eustachian tubes also enter into this part of the pharynx. Within the limits of the oro-pharynx we find the uvula, the soft palate, and the faucial and lingual tonsils.

PHYSIOLOGICAL FUNCTIONS OF THE NOSE AND PHARYNX.

The nose is an organ of smell. Nature intended that all the air we breathe should pass through the nose. Its functions are: (1) To raise the temperature of the outside air to that of the body. (2) To moisten the air. (3) To collect all foreign bodies. (4) To guard the vital parts of respiration from injury by irritants, as vapors, gases, and fumes. The nasal fossæ and pharynx give resonance to the human voice; the pharynx also has an important function in deglutition. If in any way these functions are partially or totally impaired, then the lungs and the digestive apparatus are imposed upon, the development and vitality being also considerably reduced.

CAUSES OF FUNCTIONAL DISTURBANCES.

The causes which may impair the functions of these organs can be either congenital or acquired. Of the acquired causes I may mention tumors, polypi, deviation of the septum, hypertrophied turbinates and tonsils. Certainly the most frequent are those of adenoid vegetation.



SYMPTOMS OF NASO-PHARYNGEAL OBSTRUCTION IN CHILDREN.

The earliest symptoms of obstruction in the nose or pharynx in infants is a watery discharge from the nose, the child being able to nurse for only a few minutes at a time because it cannot breathe. In older children the symptoms are severer and more constant, the discharge from the nose being muco-purulent—they have more or less cold in the head, sleep with the mouth open, are very restless, and have a hacking cough. The facial expression becomes stupid and dull. The dulness is in part explained by the impairment of hearing and by the obstruction of the cerebral lymphatic circulation. On examination, the child shows a pinched face, with a broad nose, and goes about with open mouth, dry, parched lips, and coated tongue. At the posterior pharyngeal wall we see a slimy,

muco-purulent discharge, and in twenty per cent. of cases the tonsils are enlarged. Every one of us who has had a cold knows the inconvenience connected therewith, and how the system is run down in a few days. Think of these poor children, constantly having a cold or obstruction of the naso-pharyngeal passages! What detrimental effect must it not have on the system, on the development of the child! Can we wonder that these children are backward at school and backward in growth, in the development of brain and body?

The effect on the dental arches is marked: The upper arch is narrow, high, and elongated, instead of broad and short. Malocclusion in its various forms will be found in these children, with obstruction in the air-passages. Alkan of Leipzig, after an extensive and careful investigation, came to the following conclusions: (1) The alveolar arch of the newborn child is characterized by its shortness; it furthermore gradually assumes a higher and broader aspect, in proportion to the growth of the adjacent structures. (2) In subjects with adenoids was found an arch distinctly higher, longer, and narrower than normally. (3) The configuration of the palate is not dependent upon the skull formation. (4) The anomalies of malposition of the teeth are very frequent in the abnormal positions of the maxillary bone and alveolar processes. He also found that in atrophic conditions of the nasal fossæ the palatal arch was not so high, but broader and shorter than in the normal state. From these measurements one can easily see that atmospheric influences in the nasal fossæ have a decided bearing upon the shape and height of the dental arch.

I think the sequelæ following the obstruction of the air-passages are so dangerous to the health of the children that the knowledge of these symptoms should be known to every physician, dentist, and parent; since only the early recognition and proper treatment of this condition in its incipience will prevent those dangerous sequelæ and restore the health of the child.

NECESSITY OF EARLY EXAMINATION AND CORRECT TREATMENT.

The rhinologist should remove the cause of the obstruction first, and the orthodontist should correct the malocclusion. Here I would insist that the orthodontist should have a thorough knowledge of medicine, particularly of physiology. How often do we see children who are mouth-breathers, anemic, thin, nervous, and suffering with indigestion, being treated by dentists who place mechanical appliances into the mouth, thus adding to the discomfort of the patient without removing the original cause of the trouble! These treatments often extend over two to five years' time. During this period the child attends school, and is taxed both mentally and physically. Is it a wonder that we are developing a nervous nation? The specialist in any branch must never forget to keep in mind the whole body!

The school board demands the examination of school children by an oculist, at various times, for infectious local eye diseases; is it not also necessary that a rhinologist and a dentist examine these school children, in order to avoid the evil effects which may result to the growing osseous structure of the oral cavity, to the neighboring tissues, and to respiration, from the obstruction in the air-passages?

STATISTICS.

Statistics prove that from fifteen to twenty-five per cent. of children between the ages of one to fifteen have adenoids. About seventy per cent. of all cases occur between the first and fifteenth years; twenty-six per cent. between the fifteenth and thirtieth years, and four per cent. after thirty. In sixty-four cases of adenoids Uffenorde found three cases to be of tuberculous nature. Dench reports that over fifty per cent. of middle-ear trouble is due to adenoids. The percentage of adenoids in high arch and malocclusion is believed to be large, but I have been unable to find any statistics in regard to this.

DIAGNOSIS BY MEANS OF RHINOSCOPY AND PALPATION.

The diagnosis of the obstructions in the nose and pharynx is made by anterior and posterior rhinoscopy and by palpation with the fingers. By means of anterior and middle rhinoscopy we can recognize any obstructions in the nose, and sometimes adenoids in the pharynx when the nasal fossæ are wide and unobstructed. Posterior rhinoscopy is seldom practical in children. In posterior rhinoscopy we place the mirror behind the soft palate, at the same time having the patient breathe through the nose, a light being reflected from the head mirror to the rhinoscopic mirror. Here we notice the condition of the naso-pharynx. In young children the diagnosis of adenoids can readily be made from the symptoms and the general appearance of the children, also by digital examination of the walls of the pharynx. After thoroughly cleansing the hands, I ask the child to open the mouth, then, pressing the cheek inward with the left hand between the cusps of the upper and lower teeth for protection, with the index finger of the right hand I slip over the tongue, behind the soft palate, and up into the naso-pharynx. The finger must be passed swiftly over the vault of the pharynx, into the fossa of Rosenmüller, the posterior nares, and then withdrawn. This examination takes only a few seconds, and, although disagreeable to the child, is positive. Despite the danger and the consequences attaching to obstruction of the air-passages, the prognosis is favorable if the operation be performed early and if removal is complete.

THE ANTRUM: ITS ANATOMY AND ANOMALIES.

Of the accessory sinuses of the nose, the antrum of Highmore is the most frequently affected, on account of its proximity to the nose. The inner wall with its openings enters into the nose, and the floor of the antrum is formed by the alveolar process which supports the teeth. The antrum is an irregular pyramidal cavity occupying the body of the maxilla. The roof forms also the floor of the orbit. The anterior wall extends from the side of the nose to the malar ridge. The canine fossa occupies a large part of this wall. It is a shallow groove, running upward from the canine to the infraorbital foramen. The inner wall of the antrum forms the outer wall of the nasal cavity. This wall is very thin and has the normal openings of the sinus over the inferior turbinate. The floor of the sinus is formed by the alveolar process. The floor of the antrum is, next to the nasal wall, of most practical importance, because of the proximity of the roots of the teeth, as disease of the roots of the teeth and their surrounding structure may spread to the antrum. A knowledge of the relation of each alveolar socket to the antrum is of practical importance owing to the frequent opening of the antrum through one of these sockets. No other part of the antrum shows such difference in its make-up as the floor, and no other portion is of so much practical importance. In some cases the floor is as thin as paper; in others, again, it is as much as half an inch thick. Sometimes the teeth reach directly into the sinus, covered only with the mucous membrane. The size and shape of the cavity varies in each subject, and even in each side of the same individual. We speak, for instance, of a normal-sized cavity, when the floor of the cavity lies on the same level as that of the nose. When it lies above we speak of a smaller, and when below, of a larger cavity. In the last instance we speak of a sinus alveolaris. If we bear in mind the great difference in the thickness of the alveolar process it is not difficult to comprehend why so many people have never been afflicted with disease of the antrum in spite of having had in each upper jaw nothing but carious roots, with great pain from numerous attacks of periostitis, while others having teeth almost normal, with a slight periostitis of the dental root acquire an empyema. This goes to prove that a thick alveolar process guards against infection. The antrum often

shows bony prominences, or membranous ridges, causing a stagnation of secretion. More important is the division of the antrum into anterior and posterior halves by a vertical plate. The anterior section in this case opens through the ostium maxillare into the middle meatus. The posterior section opens into the superior meatus. (Zuckerkandl has proved this beyond all doubt.) Seldom do we find that both open in the middle meatus. This, again, shows the important practical bearing of these anomalies in diagnosis and operative treatment.

ETIOLOGY OF DISEASES OF THE ANTRUM.

As to the etiology, the opinions of various authors differ. Some claim that the dental origin is the most frequent, being from 18 to 64 per cent., but the majority are of the opinion that the nasal origin is the predominating one.

In going into the details of the dental origin, I have chosen Hajek's classification—

(1) Acute inflammation; subdivided into—

a. Acute pericemental abscess.

b. Acute periostitis.

c. Circumscribed or diffuse osteitis of the alveolar process.

(2) Chronic inflammation; divided again into—

a. Chronic pericementitis.

b. Penetration of the alveolar process from a diseased tooth.

c. From therapeutic efforts in treating root-canals and in the filling and crowning of teeth—by way of the lymphatics.

d. From cysts which break into the antrum.

(3) Traumatic origin; for instance, extraction of teeth.

(4) Malignant tumors.

M. H. Cryer believes that more teeth are lost from antral disease than primarily cause it; this opinion is also confirmed by E. S. Talbot.

SYMPTOMS OF DISEASES OF THE ANTRUM.

The symptomatology is, owing to the proximity of other cavities, a changeable one. Pain and headache are usually referred to the temporal region, and those of dental origin to the affected tooth. There may be tenderness upon pressure and swelling in these regions and in the canine fossæ, disturbance in the sense of smell, dryness in the throat, and more or less obstruction of the nose. There may or may not be a discharge of the contents of the antrum; when present it is, as a rule, one-sided. Eczema of the anterior nares may be present.

DIAGNOSIS OF DISEASE OF THE ANTRUM.

From the variety and inconsistency of the subjective and objective symptoms we readily see that only in certain cases of antrum trouble is positive diagnosis possible without a thorough rhinoscopical examination. These cases are those of severe and acute types of infectious nature, and sometimes those of dental origin. The following are some of the methods employed to diagnose antrum trouble:

(1) Transillumination of the sinus by means of an electric lamp placed in the mouth. Since there is such difference in thickness of the anterior antral wall, this test is not of sufficient accuracy, as we depend upon the shadow. The thinner the wall the lighter the shadow, and *vice versa*. In this manner an empyema may be diagnosed, while in reality it is a thick anterior wall.

(2) The X-ray method, which is more valuable than transillumination, because it will show us the changes in structure of the cancellated tissue.

(3) The probing or syringing of the antrum through the natural opening. This is very difficult, and in some cases impossible.

(4) The best and positive method consists in puncturing the nasal wall underneath the anterior third of the inferior turbinate with a straight or half-curved cannula.

METHODS OF TREATMENT OF DISEASE OF THE ANTRUM.

In the treatment of antral trouble we should first remove the cause of the disease; and secondly, establish the unobstructed discharge of the pathological secretion collected in the antrum. In every case of antral empyema it is of importance to keep in view the fact that other sinuses may be affected. Tedious healing and unsuccessful operation arise from this cause.

Cooper's method. Cooper's method is more generally employed by the dental surgeon. The most suitable places for the opening of the antrum are through the sockets of the second bicuspid and the first molar, since these sockets are nearest to the antrum. The antrum may also be reached through the first bicuspid, second molar, or third molar; this, however, renders difficult not only the operation, but the after-treatment as well.

In Cooper's method the following possibilities should be kept in mind: (1) An abnormally high arch. (2) A deep canine fossa above the socket through which we would enter the antrum. (3) A distinct bulging of the external wall of the nasal fossa—this causes a contraction of the antrum at its floor.

When the trouble is of purely dental origin, and when the mucous membrane of the sinus is not extensively affected, Cooper's method will prove satisfactory. When the trouble is not of this type, or when it is associated with other sinus troubles, this method is a hopeless one.

Puncturing the nasal wall and drainage. Another method is the puncturing of the nasal wall of the antrum, underneath the anterior third of the inferior turbinate, by a straight or half-curved cannula. By a daily washing of the antrum through this cannula, and afterward blowing it dry, a cure is effected in about 70 per cent. of cases.

Luc-Caldwell operation. Should a case not yield in four weeks' time to the just-mentioned method of treatment, the total operation after Luc-Caldwell should be recommended. One may accelerate a cure in these cases by sweating the patient and by internal medication with potassium iodid.

The Luc-Caldwell operation can be performed under local as well as general anesthesia. When general anesthesia is used, the nasal fossa on the side to be operated upon should be tightly packed with cotton tampons, to prevent the inhalation of blood. A gauze tampon should be placed between the cheek and the teeth posteriorly to the incision. The lips being retracted by an assistant, an incision is made to the bone, just above the roots of the teeth, from the canine to the second molar. The periosteum with the mucous membrane is then separated from the bone by a periosteal elevator. With the chisel and bone-forceps the anterior wall of the antrum is carefully removed so that a finger may be introduced and all crevices can be inspected. All of the diseased mucous membrane is then thoroughly curetted, and the cavity cleansed. These are the most important points in the operation. Care should be taken of the infraorbital nerve in curetting the roof of the antrum. With the chisel, the bony part of the external wall of the nose under the inferior turbinate is then removed, to the floor of the nasal cavity, leaving the mucous membrane untouched. With the knife a flap of this mucous membrane is made in such a manner that its attachment at the floor of the nasal fossa is left intact. This flap is turned over to the floor of the antrum. The antrum is now slightly tamponed with iodoform gauze strips, and drained through the nasal fossa. The incision over the incisor fossa is then closed. The after-treatment is simple, the iodoform drain being removed after from six to eight days. In place of the frequent washing of the cavity, iodoform powder is blown into it, thus preventing an increase of secretion.

The success of this operation depends upon thorough removal of the diseased mucous membrane.

PROFESSIONAL OPPORTUNITY.

By C. C. ALLEN, D.D.S., Kansas City, Mo.

(Read before the National Dental Association, in general session, at its annual meeting, Denver, Colo., July 19, 1910.)

AT the time when a man is called upon to select his vocation he is so immature in judgment, unripe in experience, and defective in knowledge that he can give this vital subject no adequate consideration and no attention commensurate with its importance. If he give thought to the subject, it must necessarily come from the fallow mind of youth, and it is likely that some prejudiced or ill-founded fancy will determine his choice. Some idea undigested of an easy road to personal gain, an easy way to distinction, or the imaginary promise of emancipation from labor may direct his course. Sometimes the most trivial circumstance apparently in no way connected with a man's future may turn his steps to that vocation which will prove his life-work. Finally and most lamentably, another method by which an individual may assume the responsibility of a profession is that he may have been ordained or selected for it by parental authority or by the authority of custom. While parental authority is actuated by the most profound interest, it cannot be denied that it is generally a prejudiced interest and one self-blinded to the real qualifications of the candidate. This interest, because of its own unselfishness, fails properly to consult and analyze for adaptability.

It happens almost invariably that, no matter what calling a man has espoused, he comes, in time, especially in our restless civilization, to think that if he had chosen some other vocation he would have lived a fuller and more useful life. But notwithstanding these periods of restlessness, the individual once established in his profession usually does good and acceptable work. And from all time to the present there seems to have been no better way of replenishing workers in the various services of man than the methods we have just considered.

Even though cast for our calling by the wisdom of Divinity, we would yet have times of dissatisfaction. Nor is this necessarily reprehensible. For only through healthy unrest do we avoid stagnation and are we inspired to progress. But the dissatisfaction which is to be regretted and condemned is that which comes from selfishness, envy, and failure to appreciate our opportunities.

The beginning of a profession comes with the real beginning of life, and not when a man is full of the wisdom of experience. This always has been since man was first ordered to earn his living in the sweat of his face. It doubtless is a part of the inscrutable scheme that we should not be permitted to bring to bear too much of our personal influence in laying out the lines of our life-work. Apparent haphazard choice of vocation may be a part of the divine plan to which we have not given due consideration, a guidance which we have not recognized or even suspected. It may be a part of a higher instinct, but an instinct of the same kind that preserves all life in its youth, the difference being only that this instinct is for the preservation of balance in human employments.

So let us not give time to lamenting because of the fancied superiority of some other calling, or grieve because of some real or apparent lack of relative dignity in our own profession. Rather let us

give to it just effort, and earn our right to take advantage of the many opportunities it offers for professional recognition and extraneous cultural development. While it is true that no man can completely compass any profession, it is equally true that no profession can completely fill the mentality of any man. He has an inherent desire, a longing, a thirst for something aside from the daily routine of the business in which he has perfected himself to the point of calling it his own. Let us not forget that the first use of all professions is that they may be the servants of men rather than that men should be their servants. No man lives a completely normal life who permits his vocation to enslave him. The enslaved intellect is not capable of the flights of imagination which are absolutely necessary to the proper development of individuality, and no man can serve his fellow creatures in his proper fulness except through the expression of his individuality. True self-interest, in contradistinction to selfish interest, requires from a man that he neglect no opportunity for intellectual and moral advancement. We of this profession are allowed great privileges, perhaps greater than in most callings, for cultural attainment. We can make our profession our servant more completely than can those of many other occupations.

There is little necessity for a man of good balance permitting our profession to enslave him. Its demands of time cannot be, in the nature of things, so exacting as entirely to preclude leisure for other pursuits, and those pursuits may be selected to his liking. It is not necessary that a man should give all of his service to the world within the confines of any one channel. He may also serve in those engagements which bear to him something of the character of relaxation. If one should carry on an extended scientific investigation, he is much more likely to succeed if he pursue this investigation through an impelling though undefined desire. He should pursue it from a devotion which would defy his own analysis, were he not too oblivious to his environment to give the subject any analysis at all. So, though a man pursue a line of investigation within the proper fields of dentistry, yet for the purposes of true gain and true culture and true advancement, he should hold that particular pursuit as entirely outside the realm of his daily professional routine. In this way it becomes to him a pleasurable diversion, a child of love.

There are in our profession, as well as in others, many who peer through the blue glass of pessimism. They devote a remarkable amount of energy and time to lamentation. They fail to see that we make any progress; that we have accomplished anything, or ever will. They find fault with the *personnel* of our profession, because they fancy it lacks intellectual qualification. Did these men really see the abundant opportunity that our calling affords for all kinds of good work, they would not waste their time in abusing it and the men in it from an assumed position of superiority. These men should, for the purpose of personal experiment, place themselves outside the profession, should view it extraneously—get away from it a little while; look at it as men do who know nothing of it; get the layman's angle—and it may reveal to them some virtues hitherto unsuspected, some sweetness unappreciated because of their fretful discontent.

There are times when all of us wish for more rapid advancement, and there are times when all of us feel wofully our limitations. But there is never a time for a jeremiad against our calling which shall consist principally in abusing the good men within it, merely because they do not measure to the fancied standard of a malcontent. Such railers, wrapped in the atmosphere of their own gloomy conceit, have absolutely failed to recognize the knockings of Opportunity.

A man's vocation is his instrument for gaining a livelihood, and he is under obligation to master that vocation, that the service which he gives may be worthy of compensation. This end being accomplished, a man's fealty to his vocation merges into the greater duty of general citizenship. A man is part of the state, and should never lose sight of that fact.

The state reflects his individuality, be it good or bad. These things being true, it follows that a man's greatest privilege is the advancement of his fellows. And this can be done best by his own sublimation. Nor is it necessary for the most complete accomplishment of this high end that a man should feel within him any of the stirrings of selfish ambition, any desire for personal emolument, aggrandizement, fame, or power.

The higher service of mankind demands a range of thought which far outmeasures the confines of any profession, though thoughtful consideration takes note of the immense amount of detail which is necessary to gain proficiency in one. Few professions ramify to the extent of ours. Few professions exact tribute of so many others. Few professions require for their excellent service men of as varied accomplishments, general knowledge, and versatility. Therefore, having mastered ours, we have laid the best and most enduring of all foundations for progress.

You men have laid this foundation. You have accomplished much for dentistry. You have attained prominence, you have earned competences, you have achieved professional success. Your profession has treated you well. It has fulfilled the dreams which brought you to its threshold. How will you repay your obligation? Will you enrich it with the fulness of your enriched manhood? You have served your apprenticeship—you are masters of your craft. It has opened the doors of opportunity. Will you pass them by? You men of maturity have traveled the long road which has brought you to professional eminence. You stand where "No shadow falls to east or west, in manhood's glorious noon." You have earned an hour for meditation. Let us use it to consider our obligation to the past and our duty to the future. The fruits of all the past await your garnering. You can in some measure return to Eden. It is now that life will unfold at your command. It is the time for you to begin to live, and in this broader and fuller life you can reflect upon your parent profession that glory which will dignify it and raise it in the eyes of men. Let us view those fields and pursue those paths that tend to the broadening of cultural refinement. We can now, to an extent, escape the deadening grind. We can devote more time to the contemplation of the subtle beauties of nature. We may now receive our lessons free from the annoying intricacies of detail. Advancement may now be ours untrammeled by laborious effort. We are no longer prisoners of circumstance or slaves of necessity.

In broadening our views to the utmost we do not need in any sense to neglect or disregard our profession, but rather let us carry it with us. Great generals know more than war; great lawyers know more than law; great physicians know more than medicine; and we of our profession should know more than dentistry. Our work in dentistry is not a work which tends to arouse the mind to the dreaming of great dreams, as in the case in some of our sister professions. It has little of the glamor of romance. It is therefore necessary, in order to keep the mind in that perpetual youth which makes for all accomplishment, that the imagination be given other range and food for cultivation. This, fortunately, we are better equipped to do than many of our fellow laborers.

We must give freedom to imagination, the most majestic of all mental attributes, and wrest from the infinite store such ideas as present themselves to our minds, made receptive by cultivation. It is not necessary to specify any particular fields that we should cultivate in our seeking after higher intellectual attainments. All are open to us, and each may choose and serve according to the measure of his soul.

Let us not build with the futile idea that our fame shall live in enduring bronze or memorials of stone, but do our work for the blessing of man, so that it shall remain a beneficent influence long after all fashioned monuments shall have disintegrated atom by atom. It is not the seeker after tangible reward who recognizes his real opportunity. The alchemist sought to transmute base metals

into gold, but out of the alembics of our souls let us bring the enzyme of happiness and peace. In fidelity and gratitude shall we treasure our profession, but the majesty of destiny demands of us also a larger service: "Follow thou thy vocation, but heed the King when he calleth thee."

HOT WATER IN DENTISTRY.

By J. O. HALL, D.D.S., Waco, Texas.

(Read before the Southern Branch of the National Dental Association, at Houston, Texas, May 4, 1910.)

I HAVE made a few observations in regard to the use of hot water in dentistry that may be of interest. I make no claim to originality in these observations, except that possibly some few ideas in its application are suggested.

HOT WATER, STEAM, OR MOIST HEAT.

As antiphlogistic, anodyne, antipyretic, stimulant, counter-irritant, and cleansing agents these means have been used for centuries, long before the theory of their action was ever dreamed of.

The *hot poultice* of the good housewife and neighborhood nurse, with its thousand-and-one different ingredients, has been used for ages to alleviate suffering, and the merits of this, that, and the other agent lauded to the skies, while it was really the soothing, softening, and diffusing influence of the hot steam which brought ease and comfort to the sufferer. Have we as dentists discarded this valuable agent in the treatment of disease simply because it is too old and common? If we have, I suspect that our zeal for new and uncommon agencies has led us into error. Speaking of the theory of its action, have we any well-defined knowledge?

As a counter-irritant. I must confess that in my limited reading and study I have never found an article which threw much light upon this subject, hence my ideas relative thereto are necessarily guesswork to a certain extent. The first action of a hot application, as we all know, is to induce a hyperemia by drawing the blood to the surface and distending the parts. The capillaries are full, their walls relaxed, and the surface flushed. This results in a lessening of the tension in the underlying structures, relieving the congested area, and acting in the capacity of a counter-irritant.

As a diffusive stimulant. If the surface to which it is applied be greater in extent than the inflamed area, it further lessens the tension by drawing into healthy surrounding tissues a portion of the blood which ordinarily would have been directed to the seat of the inflammation; hence, in its application, I direct it upon as broad a surface as is possible or convenient. It is then acting as a local diffusive stimulant.

As an antipyretic. As it evaporates, and the surface assumes its more natural temperature, it absorbs heat from the inflamed tissues, and then acts as an antipyretic.

As an antiphlogistic. By relaxing and stretching the walls of the tiny vessels, it promotes diffusion and absorption, getting rid of the products of the inflammation by increasing the already large army of leucocytes and affording them an easier journey to their final haven of refuge where they may digest their meal of bacteria at their leisure. In this and all other actions moist heat is an antiphlogistic. So much for its first effects.

As is well known, its secondary ac-

tion tends to deplete the parts by driving the blood out of the area to which it is applied; for example, the washerwoman's hands, which at first were red and full, finally become white and shrunken. This condition is, of course, impossible to obtain in a highly inflamed area, but it serves to illustrate the action which is taking place in the tissues.

As an anodyne and sedative. As to the anodyne properties of the poultice, any one of the above properties would of necessity reduce the pain, but moist heat exerts some subtle influence upon pain apart from the influence exerted by any or all of the foregoing actions, which I can only guess at by saying that it is a direct and powerful nerve sedative. A severe and obscure neuralgia, for instance, will often yield to an application over the affected area, of a hot pack which is changed at intervals as it cools. In this condition no inflammation exists anywhere near the region of its application, and it acts apparently only as a nerve sedative.

INDICATIONS FOR THE USE OF WARM WATER, AND THE MANNER OF ITS APPLICATION.

(1) Warm water should be used at the chair at all times during operations upon the teeth. It is more agreeable to the patient, and does not produce a shock if thrown upon a sensitive tooth.

Have you ever considered, in flushing out the mouth preparatory to making an examination, that a stream of cold water thrown upon a sensitive tooth will often occasion nervousness to the patient? Thus the operation is started under the most unfavorable circumstances. The patient begins to look for "bogies" at the outset, and the operator loses that perfect control and confidence so essential for his own as well as the patient's comfort during the operation. Having observed this fact, I use in the mouth nothing but warm water—unless when testing for a sensitive tooth—varying the temperature according to conditions. If there be considerable inflammation or a thick mucus, I use the water as hot as is comfortable, and always in combination with an antiseptic.

I use carbolic acid in from 1:500 to 1:250 solutions. If this happens to be disagreeable to the patient, I disguise the odor and taste with some one of the numerous available antiseptic solutions. Phenol solutions do not injure the instruments, and are borne better by the patient than anything I have tried.

I believe ordinary sanitary precaution demands that we begin all operations and examinations by first flushing out the mouth with a warm sterilized solution, taking a large pledget of cotton in the pliers, wiping about the teeth, then having the patient rinse his mouth thoroughly. This takes only half a minute, and is a natural and easy introduction to the real work. Patrons appreciate the extra trouble, for many of them have told me that their first favorable impression was due to this practice.

The germ theory has become common knowledge, and our patrons like to think that we are taking every precaution to protect them from the dangers of infection.

AFTER-PAIN FROM EXTRACTION.

This pain is hard to control and is often very severe, lasting from fifteen minutes to two hours after removing an abscessed tooth. This pain is produced, largely, by immediately releasing the pressure from an inflamed area; the nerves having adjusted themselves somewhat to the pressure will set up a protest when this pressure is instantly removed. We all know from experience that it hurts just as badly to suddenly release the pressure upon a mechanical separator as it does to suddenly put on that pressure. *Hot water*—as hot as it can be borne—is the only agent that I have found to control this pain. Immediately upon extracting an abscessed or infected tooth, I syringe out the socket two or three times with a hot carbolic solution; then, as soon as the hemorrhage begins to abate, I dismiss the patient from the operating chair, give him a cup of hot carbolized water, and direct him

to hold a mouthful over the wounded gum until it begins to cool, then spit it out, and repeat. In about fifteen minutes the pain will usually abate. In this way I also save much time, as otherwise a patient will often sit and spit for half an hour and delay my work, making the next patient nervous and fretful at the delay. If I have taken out a number of teeth or an unusually bad one, I direct the patient to use hot water with listerine or some other wash three or four times a day, at home. This helps the healing process, and prevents infection of the blood-clot and dry sockets.

INFLAMMATORY CONDITIONS OF ERUPTING AND IMPACTED THIRD MOLARS.

No pathological condition in dental surgery has given me so much trouble as inflammatory conditions of erupting and impacted third molars, and in the early years of my practice I spent many uncomfortable hours contemplating the havoc which I had wrought in attempting to alleviate this condition. It has been my observation that less definite results are obtained in the treatment of this trouble than in that of any other. The whole burden is thrown upon nature, and in addition the inflammatory process is often aggravated by the usual treatment which obtains in these cases. This consists ordinarily in the indiscriminate lancing and cutting away of the overlying gum structures, then medicating more or less freely with the old standby, aconite and iodin, and dismissing the sufferer with a prayer for his speedy recovery—the prayer being the better part of the treatment. This treatment is carried out by a large percentage of dentists regardless of the nature of the inflammation or the condition of the surrounding parts. I am firmly convinced that in nine cases out of ten the patient would have been better off if left alone. I should like to lay down a rule that no lancing or cutting away of the gum should ever be attempted while the inflammation is in the ascendancy—that is, before resolution has begun: all such work ought to be done after the inflammation has subsided, to prevent a recurrence of the attack. Lancing and cutting only add fuel to the flames. These parts by their anatomy are specially predisposed to inflammation. There is a natural pocket surrounding the advancing tooth, formed by the loose cellular and mucous tissue. In this pocket mucus and serum is constantly present, and any irritation is quickly followed by infection, and as there is an abundance of the best culture media, the inflammation is easily excited and spreads rapidly, often extending into the tonsils in a few hours.

As the gum tissue begins to swell, it closes in over the tooth more and more firmly, preventing any drainage of this natural pocket, with the result that an artificial pocket soon begins to form. It is to this point that we wish to direct our treatment.

I first direct a spray of hot water (carbolized) 1:250, to which I add absolute alcohol about 1:10. The alcohol seems to promote evaporation and consequent absorption of heat.

I continue this for two or three minutes, then saturate a mat of cotton of about the size of a twenty-five cent piece with the following solution:

℞—Campho-phénique,	℥ss
Cocain hyd.,	gr. x
Alcohol,	gtt. xx
or q. s. to make a clear solution	

and lay this over the inflamed area, directing the patient to close the mouth, while holding the cotton in position. While this is in place I arrange and sterilize probes, instruments, abscess syringe, etc. This usually occupies about five minutes. Next I remove the cotton and proceed to locate the focus of the inflammation.

The tissues are partially anesthetized, in order to render them less sensitive to exploration. About the best instrument for this purpose is the long curved excavator. This can be worked under the gum carefully, and passed down behind and to the side of the tooth cautiously, feeling the way until the pocket, which is nearly always deeper than one would

suspect, is located. Upon removing it with an excavating movement, a thick cheese-like pus is often brought to the surface. The removal of the instrument will be followed by a hemorrhage with particles of pus floating in it. After having in this way located the seat of the trouble the treatment is comparatively easy.

A large abscess syringe, or other syringe to which a small curved point can be attached, is filled about half-full of the hot-water solution, then the rest with hydrogen dioxid. This imparts to the hydrogen dioxid the proper temperature, and dilutes it so as to prevent its too vigorous action. The explorer is then reintroduced into the pocket, and the gum gently pushed back to form a vent or exit for the blood, pus, and syringing solution. The point of the syringe is then introduced into the pocket, and the solution at first gently forced into it. Care should be exercised in forcing any solution into an inflamed area or pus pocket, more especially hydrogen dioxid, as it does not take kindly to confinement, and will seek to escape in almost any direction except the right one, carrying the waste matter along with it and causing most excruciating pain. After the first syringing, the hot-water solution may be forced into the pocket somewhat more strongly, and the gum may be followed around, flushing it out thoroughly, removing the irritating serum and refuse particles, which almost invariably find lodgment between the tooth and gum. Then with a more powerful syringe the point between the second and third molars at either the bucco- or linguo-gingival line is located, and the solution is forced between them, flushing them out thoroughly. A secondary pocket is nearly always present at this point, but this having a natural vent, greater force may be used.

The operator is then ready for the hot-water spray again, which is applied for about five or ten minutes. Then some of the campho-phénique solution, or aconite and iodin, is introduced into the pocket and between the tooth and gums, working it down with a probe or some special applicating syringe. Then a mat of cotton saturated in the same solution is applied, and the patient is seated in another chair, holding the medicine in place for from ten to fifteen minutes. Usually the pain induced by the probing and syringing begins to abate in that time, and if so, you may feel assured that the patient will pass a comfortable night and resolution will be in progress by morning. If the case be a bad one, and the jaws are in such a condition that the parts cannot be thoroughly treated, I send the patient home to bed, prescribing a saline purgative and hot foot-bath, and directing that cloths be wrung out of hot water and placed over the jaw, face, and neck, and covered with a large towel to hold the steam in contact with the parts. These packs must be as hot as can be tolerated without blistering, and changed as they cool, continuing this for an hour if necessary, and repeating if the pain continues. If the patient be unable to sleep, a sedative is indicated, and I have found nothing so satisfactory as the following:

R—Aspirin,	3ss
Codein,	gr.jss

M. et ft. chart. no. vi.

Sig.—One every half-hour until relieved.

If the patient be a business man, or a stranger and unable to go home, I direct him to the barber, who applies the hot towels (as per instruction), and takes quite an interest in the treatment. This treatment will probably consume thirty minutes or so, but the patient will as a rule cheerfully compensate you for your time.

INCIPIENT ABSCESS.

The pain due to a developing abscess is difficult to treat, and often occasions the young dentist a vast amount of mental anguish and uncertainty. The first indication is to properly open up the affected tooth, cleanse the canals as thoroughly as possible, and flush them out with the hot-water solution. I do not attempt to clean out the entire root at first with a broach, for fear of forcing

some of the detritus into the already infected apical space. I then pass a fine, smooth broach carefully through the apical foramen to make a vent for the escape of the gases already formed and those to be formed. Forcing medicaments into the forming pocket only adds fuel to the flames, as they are in themselves irritating, and increase the already high tension of the parts. The hot-water spray is then directed upon the gums and continued for several minutes, alternating every minute or so with ice-water spray. The cold water reduces the tension immediately, affording temporary relief, and in conjunction these sprays promote speedy resolution, and often entirely abort the abscess. The hot pack is then applied by the assistant, or direction is given to use it at home, together with such other general treatment as the indications may call for. If, as sometimes happens, all treatment fails to give relief, the only possible measure is to hasten the formation and evacuation of the pus. In such a case the hot, moist poultice is the measure *par excellence,* as it hastens the formation of the pus and relaxes the tissues. Anything may be used to make the poultice—bran, flaxseed meal, corn meal, or the plain hot pack. In the last case, I should allow the poultice to become quite cool before replacing it, for as it cools it absorbs heat from the inflamed area. Some care must be used to prevent the abscess from pointing to the outside of the face. The patient is cautioned to discontinue the use of the poultice as soon as the pus breaks through the bone, which will be manifested by the rapid swelling of the soft tissues and a lessening of the pain. If this condition threatens, then the ice pack, applied over the focus of inflammation, will serve to drive the abscess back to the inside of the mouth, where it should be lanced.

CHRONIC OR AGGRAVATED GINGIVITIS.

This condition is a common one, and generally yields readily to the ordinary treatment of thoroughly removing the deposits of calculus, cleansing the teeth properly, and stimulating the gums with an astringent and counter-irritant. The hot spray and douche, however, are invaluable adjuncts, and hasten the healing process.

For cleansing the interproximal spaces and washing out the septic mucus, serum, and foreign particles, I have found nothing better than a strong syringe with a small point, which is placed between the teeth and between the gums and tooth if possible, the hot-water solution being forced into the space. This spray flushes and floats out the septic secretions and stimulates the gums to healthy activity. To my mind the greatest irritant in such catarrhal conditions is the mucus, which is secreted in superabundance and is broken up or decomposed in a very short time—it being an excellent culture medium, and becoming infected the moment it reaches the surface. I direct the patient to use an antiseptic mouth-wash in connection with the hot water several times a day, showing him how to rinse the mouth so as to force the solution between the teeth and gums.

The *modus operandi* is the same in the treatment of pyorrhea, with the necessary modifications to reach the pockets, and it greatly assists in the treatment of this troublesome disease.

I am indebted to Dr. J. Y. Crawford of Nashville, Tenn., for information concerning the treatment of various dental disorders by the use of Russian and Turkish baths, and while I believe these to be a great agent in the treatment of pyorrhea, neuralgia, coryza, and inflammations generally, I have not, until recently, had access to the Russian bath in my home city, and have had no practical experience in its use. Any case of empyema or engorgement of the antrum of Highmore I shall certainly treat in this manner.

CONCLUSIONS.

In describing the use of hot water in the above conditions I have not attempted to present a general and full description of treatment, but only such portions as were necessary to bring out

the use of hot water. I believe a more general use of this valuable agent will bring added comfort to our patients and satisfaction to ourselves. I was induced to make these remarks by my firm belief in its value, and because I see so few of my brethren taking advantage of it. I believe that, as members of the healing art, we should use every legitimate means for the welfare of our patients and the advancement of our profession.

The general practitioners of medicine have neglected a very valuable adjunct to their art, viz, massage, which in its proper application is a very valuable agent; and thus, owing to carelessness and disuse, an army of so-called osteopaths has sprung up all over the country, who claim everything and reap the reward which should rightfully belong to the M.D. Let us not through disuse lose the prestige and service which this great agent, hot water, affords us, if skilfully used.

THE DUTY OF THE GENERAL PRACTITIONER TOWARD CASES OF ORTHODONTIA WHICH OCCUR IN HIS PRACTICE.

By HARRY E. KELSEY, D.D.S., Baltimore, Md.

(Read before the National Dental Association, Southern Branch, at Houston, Texas, May 4, 1910.)

WHILE this subject has not been entirely neglected in the recent literature of the profession, it yet seems worthy of a further brief consideration, and I therefore invite your attention to the following remarks:

THE PRACTITIONER'S DUTY IN CASES OF ABNORMALITIES.

It will certainly be granted by everyone that all abnormal conditions of the body are unfortunate, and demand the sympathy and conscientious aid of those who profess to treat them. Furthermore, it is clearly the duty of these to call attention to impending abnormalities, and this is a responsibility which both doctor and patient are beginning to recognize more fully. There is scarcely a more prevalent or distressing class of abnormalities than the various malocclusions of the teeth, with the attending malformations of the dental arches and adjacent structures. It is bad enough when merely the health or bodily comfort of the sufferer is involved, but in these cases there are added the unsightly and often repulsive distortions of the features with which we are only too familiar.

Knowing with what certainty these conditions may be prevented from developing in the adult by early and intelligent advice and treatment, the severest censure is due those practitioners whom the public depend upon for advice if they fail to give it at the proper time, or if what they give is not correct and such as may, if followed, produce worse conditions than already exist. That antiquated ideas and methods are still adhered to and made the basis of advice and treatment by many general practitioners cannot be denied, as we are constantly brought face to face—in a very literal sense—with the results of it, and it is equally true that no one is so likely to have an opportunity to observe at an early age impending malocclusions as is the general practitioner of dentistry. Upon him, therefore, devolves a responsibility which it is his duty to be prepared to meet to the best of his ability.

THE CITY VS. THE COUNTRY PRACTITIONER.

In relation to this subject the general practitioners may be divided into two classes: those practicing in the larger cities, whose patients have access to the orthodontia specialist, and those practicing in the smaller towns or the country, whose patients have not, as a rule, the opportunity of either consultation or treatment by a specialist. Manifestly it is the duty of both to be prepared to recognize conditions which require treatment, but the country practitioner will be in most cases called upon to give the treatment, while he who is located where there is a specialist may end his responsibility by sending his patient to him.

DIFFICULTIES IN COMBINING GENERAL AND ORTHODONTIA PRACTICE.

As an orthodontia specialist and teacher of orthodontia in a dental college, I naturally feel it my duty each year to instruct the students who come under my teaching as to the advisability of attempting to treat cases of orthodontia, and it has been my custom to recommend those who expect to be near a specialist to send their cases to him, for, apart from personal interest, I believe from some years' experience in trying to do both general practice and orthodontia that both my patients and myself suffered as a consequence—and I do not mean merely the orthodontia patients but the others as well, for when our efforts are too greatly divided we surely cannot do either ourselves or our patients justice.

NECESSITY OF ORTHODONTIA TRAINING FOR THE COUNTRY PRACTITIONER.

On the other hand, those who expect to practice in the smaller towns or the country I advise to give more of their time and attention to the technical as well as to the theoretical side of the subject, not only during their college course but afterward, for they are almost compelled to do some of this work, and though they may not be able to give as efficient service as the specialist who can devote all his time and energy to it, yet they can by advice and judicious treatment, together with a recognition of their limitations and the demands of other classes of patients upon them, do much good, and avoid doing harm if they are properly grounded in the basic principles of occlusion and the structural changes that take place in the dental apparatus as a whole during and subsequent to treatment.

NECESSARY RANGE OF THE STUDENT'S TRAINING IN ORTHODONTIA.

The time of the dental student of today is too much occupied with many subjects to enable him to become a specialist in any, even were his mind prepared for the deeper study necessary and the broader application of that study. The riper judgment which will be productive of the highest attainments in any one branch is only acquired by special study, practice, and experience.

What is possible, however, for the student to acquire while at college is a thorough knowledge of the basic principles underlying this subject, which will fit him to give at least safe advice, and, with earnest thought and application, beneficial services if required of him.

To begin with, he should acquire such a perfect familiarity with normal occlusion and the forces governing it as will enable him to recognize it immediately or to note deviations from it; next a thorough understanding of and familiarity with the Angle classification of malocclusions—and understanding and familiarity are equally essential; then a knowledge of bone development, resorption, and rebuilding, and in the light of this knowledge, a close study of the etiology of malocclusions, together with the evils resulting from mutilations occurring as the result of extractions or accidental loss of teeth; finally, as much practical experience in the movement and retention of teeth as other claims upon his time will allow.

Until within a few years such a prep-

aration was not to be had in dental colleges or elsewhere, because the truth upon which it is based had not been discovered.

With the advent of the Angle classification of malocclusions all was changed, however. It was not an intricate method or system invented but a truth discovered by an earnest seeker, and upon it as a foundation he built the framework of modern orthodontia. It has been embellished by other able men, but no one has been able to change the original truth contained in his discoveries, because truth, like the elements, is unalterable.

What the student may learn in the dental college today, the practitioner who is unfamiliar with it should also learn out of college, that he may be able to give intelligent and beneficial advice to his patients; and it is furthermore the belief of the writer that the general practitioner of medicine, and especially the rhinologist, should acquire a knowledge of the fundamental principles of this subject, that he may be able to advise treatment when it is needed.

CONCLUSIONS.

It would seem, then, if the foregoing considerations be true, that the general practitioner, if actuated by concern for the patient's interest as well as his own, would find it wise to refer orthodontia patients to the specialist where it is possible to do so; but, on the other hand, he should not fail to recognize that when this is not possible, it becomes his duty not only to be prepared to give such advice as may prove preventive, but to give intelligent aid, so far as other claims upon his time will permit, when abnormal conditions are already established.

TWENTIETH CENTURY DENTISTRY.

By W. A. SPENCER, D.D.S., Carbondale, Pa.

(Read before the Susquehanna Dental Association of Pennsylvania, at its annual meeting, at Harvey's Lake, Pa., May 24, 1910.)

THE selection of a subject for a paper to be read on an occasion like the present, by one who has no pet hobbies, is not an inventor, and who is himself indebted to the profession for most of what enables him to continue in practice, is a difficult task. The best that can be hoped for is that he may, through experience and observation, be in a position to comment upon present-day methods of practice and the tendency of the times in relation to the welfare of the dentist and his patient.

Twenty years ago we were told by prominent men in the profession that the service of the dentist was a luxury, and I believe that the public in general was of that opinion. Today, however, the service of the dentist is conceded to be a necessity. Our aid is now rarely sought to gratify the vanity of the individual, and we are less frequently called upon to simply relieve a condition of suffering. We have assumed a more responsible position, and are required to furnish to our patients not only freedom from pain, and an esthetic appearance, but to safeguard the general health so dear to every thoughtful person. Each generation sees an increased demand upon the medical and dental professions for instruction in prophylactic measures. The public generally is more willing to act upon the advice of authoritative persons in hygienic matters, and more willing to learn those things which con-

serve the health and beauty of the individual.

The time is fast approaching when those in charge of public schools and public institutions will be required to provide proper means whereby those under their care may receive instruction, and if need be, service, along dental lines.

The dentist who fails to recognize these tendencies is not awake to his opportunities, and if he neglect to instruct by all legitimate and unselfish methods those whose confidence he holds, is not performing his whole duty toward the public nor toward his brother practitioner.

THE PUBLIC AND THE "PARLORS."

The public is not interested in the ethical side of professional practice, and is therefore not qualified to distinguish between the ethical and the unethical—in fact, could scarcely tell one the difference between a dental society and a labor union; has no objection to a legitimate advertisement of any kind—indeed, in its thirst for knowledge, demands advertising. The public can, however, distinguish between the narrow, selfish, personal kind of treatment, and the broad, unselfish, humanitarian kind that should naturally be expected to emanate from those claiming professional dignity. The tendency among professional men to allow the unscrupulous to furnish the great bulk of enlightenment to the public cannot be of the highest benefit to the public nor for the greatest good of the dental profession. Time spent by capable men and money spent by unselfish dental societies would produce a character of advertising calculated to benefit humanity and elevate the profession.

A former period of secrecy and jealousy has been followed by a period of good-fellowship and helpfulness among dentists, and a product of this period is the dental society. Through this institution we are coming closer to other professional bodies and to the public itself. Through it we can institute educational and charitable work with less danger of the accusation of selfishness and narrowness. The lines along which the physician, the dentist, and the public have been laboring are coming much nearer together than they have been, and the separating factors of selfishness and suspicion are less prominent, while the opportunities for harmonious work for the general good were never so abundant as at present. The suspicious, critical man is now the exception. Readiness to acknowledge professional and business ability in another of like calling, and willingness to lend a hand to any who show the least ethical disposition is the rule.

FEES.

Sound business principles applied to practice, and a wholesome desire to know the actual cost of professional service, are commanding attention. The cost system of bookkeeping so carefully worked out by up-to-date manufacturing companies is studied by thoughtful men. Not long ago a young practitioner called my attention to some figuring he had done, and it might be of interest to review his work here. His object was to ascertain what amount per hour should be applied to fixed charges—providing that he worked seven hours per day and two hundred and seventy days per year. Two hundred and seventy days per year would leave him free Sundays, holidays, and allow a month's vacation. Here are the figures:

Cost of dental education, including board during college terms	$1800
Amount he might have saved in three years, had he not gone to college	600
Total	$2400
Interest at 6 per cent. per ann.	$144
Cost of locating and equipping office —$1600—upon which interest is figured to cover depreciation	160
Office rent, at $25 per month	300
Insurance	20
Bad accounts	100
Care of office	100
Fixed charges per year	$824

The sum of $824 divided by 1890, the number of working hours per year, gives

him 43½ cents per hour fixed charges. While the figures are not accurate by any means, they are surely conservative, and they illustrate a point vital to all of us. It may be seen that this man must figure on 43½ cents per hour before he adds any cost of material going into his work. If after such addition he includes the salary he ought to command, he will arrive at the proper charges to make to his patients. Is it any wonder, with the fees for which some dentists work, that they are required to labor nights, Sundays, and holidays, and are too busy to devote any time to outside projects or charitable enterprises?

Many dentists, through inexperience or lack of confidence in themselves, fail to place the proper valuation on their services, and through false pride and a desire to be considered "classy," convey impressions which are misleading. At first they think they are succeeding financially, and when they discover they are not, are too proud to live less expensively and too much afraid of losing patronage to greatly raise their fees. Many a dentist endeavors to maintain a social position among people whose financial standing makes them desirable as patients, when his income will not allow him to do so. He is often led to live so close to his earnings that it is a continual struggle to pay his bills, to say nothing of saving anything. He is continually putting the best foot forward. The public and those of his set never realize the heavy expense under which he is placed for education, equipment, and supplies, and the comparatively short period of his active professional life, call him a "good fellow," and if he pays as he goes they consider his financial success assured; while, as a matter of fact, when his body is bent and worn, his nervous system short-circuiting, his accelerator useless, he is consigned to the scrap-heap—a financial failure!

SPECIALIZING IN DENTISTRY.

The tendency to specialize is becoming more general, partly from choice and partly from the fact that the financial returns are greater from one branch of practice than another. Prosthetic dentistry is not receiving its just attention, especially where there is little operative procedure connected with it. There has been very little, if any, improvement in effectiveness or appearance of artificial dentures within the memory of most of you.

One reason for this is that prosthetic work requires as great or greater skill than operative, while the compensation which the majority can command is much smaller than in operative work. For that reason a great percentage of this work is turned over to men not familiar with the requirements, or to men who, for want of skill or education, cannot conduct an operative practice successfully.

The average present-day laboratory denture, or bridge, is not "a thing of beauty and a joy forever," and its loveliness does not increase. Neither is it a fit example of hygienic construction, artistic skill, or mechanical perfection, such as should be expected from men who lay claim to excellence along these lines. I am sorry to confess, however, that either will bear comparison with the bulk of such work coming from the offices of most dentists. And to our discredit we must confess that the education of the public in regard to prosthetic work has been left almost wholly to the unscrupulous advertiser, and has consisted of quotations of prices.

While the stamp of the laboratory may be in evidence upon a portion of our work, the trade-mark of the supply man is all over us and him. The public, blind to the luster of the manufacturers, sees the dentist only and holds him responsible, not knowing that without the reflection from that august body we should indeed appear dim. We obtain equipment and stock which, in the matter of utility, beauty, and adaptability, is in the front rank of progress. Our every demand is met promptly and he delivers the goods. We pay the freight, however high. Without the supply man how should we be supplied?

It is beyond dispute that the dentistry of today is the best the world has ever seen. The public is better served, the dentist more competent and better qualified, if not better paid. The desire was never stronger among dentists to serve the people honestly, intelligently, and faithfully. To inflict less pain, to conserve the general health, to beautify the personal appearance, to teach those who know it not the gospel of cleanliness, is the practice of today.

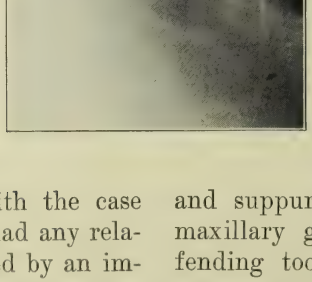
CORRESPONDENCE.

LUDWIG'S ANGINA DUE TO IMPACTED THIRD MOLAR.

To the Editor of the Dental Cosmos:

Sir,—In the June issue of the Dental Cosmos, Dr. H. R. Sparrevohn of Los Angeles reports an interesting case of so-called Ludwig's angina, in which the physicians connected with the case doubted that the symptoms had any relation to the irritation produced by an impacted third molar. I think there can scarcely be any doubt that that malposed molar, of which a very good radiograph was presented (see Dental Cosmos for June, pages 645, 646), was the cause of the serious symptoms reported. These will unquestionably recur unless the molar is removed, and removal should take place without delay. Anyone who has had much experience in the skiagraphing and observation of such cases would have no hesitation in suspecting dental irritation as the origin of the symptoms reported in that case.

The accompanying skiagraph represents an impacted third molar in the mandible on the left side, referred to me by Dr. Arthur Osgood of Boston. There were pain, swelling, inflammation, and suppuration in the region of the maxillary gland. Removal of the offending tooth promptly brought about recovery.



In general the medical man is too apt to overlook the reflex irritations produced by teeth. There is evident need of skiagraphy to clear up these obscurities of diagnosis in conditions of the face and cranium. There should likewise be a greater readiness to admit the importance which teeth have in producing pathological conditions of the tissues.

Yours truly,

Herbert McIntosh, M.D.

419 Boylston st., Boston.

PROCEEDINGS OF SOCIETIES.

NATIONAL DENTAL ASSOCIATION.

Fourteenth Annual Meeting, Denver, Colo., July 19, 20, 21, and 22, 1910.

GENERAL SESSIONS.

TUESDAY—*First Session.*

THE first general session of the fourteenth annual meeting of the National Dental Association was called to order at 10.30 o'clock Tuesday morning, July 19th, in the Auditorium, Denver, Colo., by the president, Dr. Burton Lee Thorpe, St. Louis, Mo.

The President introduced the Rev. A. H. FISH, pastor of the Central Presbyterian Church of Denver, who invoked the divine blessing on the deliberations of the association.

Dr. H. J. BURKHART, chairman of the Executive Council, announced as the program for the first general session, addresses of welcome by Hon. John S. Irby, Denver, and Dr. E. R. Warner, Denver, and response by Dr. B. Holly Smith, Baltimore; these to be followed by the President's address, and that to be followed by a paper by Dr. C. C. Allen, Kansas City. Dr. Burkhart announced that Section II would meet in the afternoon at 2.30, when papers would be presented from Dr. J. V. Conzett, Dubuque, Iowa, and Dr. D. Stern, Cincinnati, Ohio. The program for the evening session would be announced later in the day. The paper for the general session on Wednesday at noon would be that by Dr. J. Leon Williams, London, Eng.

The president, Dr. Thorpe, then introduced the Hon. JOHN S. IRBY of Denver, representative of the mayor, who made the following address of welcome:

WELCOME FROM THE CITY OF DENVER.

Mr. President, and gentlemen of the National Dental Association,—It gives me pleasure to extend to you a "welcome" to Denver—a city which makes that pleasant word full of meaning and reality. No one regrets the absence of the mayor more than I; I am as the shadow representing the substance! I am sorry that you are not welcomed to Denver by the man who is building it; by the man who is spending his days and his nights in an effort to make the city he loves a more beautiful and a better place in which to live. I am sorry on his account that he is denied the privilege of extending a greeting to this splendid body of men and women. His pride in Denver would have clothed that duty with an unction and a zest. But, ladies and gentlemen, his loss is my gain. This is the happiest moment of my life!—I have waited a long time for this golden opportunity. I have suffered much at your hands and from the tortures inflicted by your instruments. It has been a long lane, but it has turned at last. Byron, in his "Mazeppa," said:

> And if we do but wait the hour,
> There never yet was human power,
> Which could evade, if unforgiven,
> The patient search and vigils long
> Of him who treasures up a wrong.

Now it is my turn!—at last I have you in the chair, and if I bore you for an hour on the subject of the tariff or any

other old subject, it will be a slight punishment compared with the boring I have had to endure from the dental engine. Now, of course, I *could* pull it out with one jerk, and have the agony over, but I prefer to take lots of time, and kill the nerve—I have no other appointment for the day except with you.

As a politician I am delighted to welcome the men with the "pull," the men to whom we show our teeth in a purely friendly spirit, all unconscious of our fate, as the flower that opens its heart to the bee bearing the pollen on its wings.

That portion of our anatomy which is the subject of your skill and solicitude causes us trouble from the very inception of life. It brings us pain, even in our swaddling-clothes. Adam and Eve had much to be grateful for because they escaped teething. I know of no one thing which unfits a man for citizenship like the toothache. It was the thing which first brought about my early conclusion that life was not worth living. On the plantation in Virginia where I was born, the only sufficient excuse for drunkenness among the negroes was the toothache. The method of pulling teeth in those days, while more unique than that now employed, was just as effective. The oldest and wisest of the blacks upon the plantation would tie a string to the tooth, fastening the other end to a bedstead, then seizing a chunk of burning wood from the fire-place, would thrust it suddenly in the direction of the face of the patient, who, to avoid the fire, would jerk his head back, and out would come the tooth. There was a superstitious belief among the negroes that if the patient thus pulled his own tooth, there was less liability of evil consequences.

While the toothache was a sufficient excuse among the negroes for drunkenness on the plantation, they would have to make good by having the tooth extracted, either during the spree or afterward. I remember one old negro, who had been sober for so long that I said to him, "Uncle, what is the matter, that you haven't been drunk for so long—have you reformed?" "No, massa, no," he said, "I ain't reformed, but I ain't got but two teeth left, and I'm savin' dem fer Christmas."

Ladies and gentlemen, we are delighted to have you in Denver; the chiefest city of the land of sunshine and desert, of rocks and gold, of sun-capped peaks, of myriad-colored cañons, of ever-changing and never-ending grandeur. Fill deep your lungs with our life-giving ozone. Climb to our jutting crags or flick a fly over some of the five thousand miles of our trout streams; then come back to Denver, the city of light and broad boulevards, of clean streets, of cozy homes, of sincere, broad-minded people—and you will be so absorbed with the joy of living that you will have no time to find fault with your neighbor—and no time to dwell upon the vagaries of the muckrakers. I thank you.

The PRESIDENT. I now have the pleasure of presenting to you a gentleman who is largely responsible for the success of this meeting—who, I might say, is the instigator of it, and whose days of most assiduous work, combined with his executive ability as an organizer, has perfected what I hope will be the best meeting of the National Dental Association ever held.

It is my pleasure to introduce Dr. EUGENE R. WARNER of Denver with a

WELCOME FROM THE PROFESSION.

Mr. President, ladies and gentlemen, —I am sorry that the Governor is not here to give you an address upon the resources of Colorado, and I was rather fearful that Colonel Irby would consume that hour and a half in elaborating upon the history of dentistry as revealed to him; but I am pleased to be before you—not that I choose to speak individually, but as in behalf of the dentists of Colorado, welcoming the profession to this city, which we look upon as a fair one and as a representative of what the West will be in the years to come. I regret exceedingly that the heat has been sufficient to cause many of you that unpleasant sensation of discomfort, but it has dawned upon me that Providence has recognized this great crusade for better

teeth and better health in our community and in the country generally, and as better mastication induces better assimilation, which in turn brings better health to the individual, and as heat is one of the best of germicides, has concentrated the rays of the sun upon us at this time. If it brings you distress, keep upon the shady side of the street, and if you cannot even then escape the consequences, just lay it upon the altitude, which is our common way of getting out of trouble.

I am not going to elaborate upon what our committee has done. I would take exception to the statement just made by your president, for the whole local committee is responsible for what has been accomplished. I will say that the dentists of Denver and of the state have joined forces to make this meeting a success. It is through the energetic efforts of the chairmen of the different committees—the combined efforts of all of them—that are brought about such results as we hope to obtain.

We have planned for your entertainment a few things which I hope will bring to you a realization of what it means for you to be with us in this city; but it has been the desire of the officials of this society to make this meeting a matter of business first and pleasure afterward, and we have adhered to that plan.

There will be, on Tuesday and Thursday evenings, section work in the theater portion of the Auditorium. Wednesday evening is the great "Oral Hygiene" evening, devoted to the interests of the general public. On Thursday afternoon, at one o'clock, there will be a complimentary luncheon to the visiting ladies at the El Jebel Temple. On Friday evening we shall take a night off, and go by trolley from the Brown Hotel to Lakeside, one of our summer-outing places, where you will all be admitted to the grounds and allowed to go at your own free will, doing the various stunts.

For Saturday morning the local committee of arrangements has planned a complimentary trip to all the visiting dentists and their ladies to Glacier Lake over the "Switzerland Trail," above the city of Boulder, leaving here about 8 A.M. and returning about 6 P.M., having a picnic luncheon at the Glacier Lake. I am sure you will enjoy that very much.

For Sunday a special train has been provided at special rates for a trip to Mt. McClellan over the Colorado and Southern Railway, above the Georgetown Loop, which will take you to an elevation of 14,000 feet, the highest point reached by a railroad in the world.

I assure you that any local man in Denver of whom you may specially seek some information, if he is not in a position to give it you directly, will tell you where to obtain it; if he does not, we shall try to ostracize him!

I thank you for the privilege of speaking to this audience, and assure you that we welcome you one and all to our city and state.

RESPONSE TO ADDRESSES OF WELCOME.

To these addresses of welcome, Dr. B. HOLLY SMITH of Baltimore, Md., responded as follows:

Mr. President, representatives of the State Government of Colorado and the City of Denver, ladies and gentlemen,—It is a beautiful thought that, stamped upon "old glory," the flag of our nation, is a star for every state in the Union, and wherever that banner is unfurled to the air the American citizen is at home. I stand here today to respond to your words of greeting and welcome, as the representative of the National Dental Association of America, an association whose membership is made up of men from every state and territory of our country. Our pilgrimage to you is but a home-coming—it is but a visit to a part of our domain with which we want to familiarize ourselves, and which we would cultivate into even greater usefulness to humanity.

This is the first time that our meeting has been held so far west, but the association is as much western as it is eastern, and indeed, in the flush of your cordiality, I am disposed to wish it more western than anything else. So far as I am concerned, I could almost wish that

it were with this pilgrimage as it was in the South in the good old times "befo' de wah," when friends would drop in for a little visit, and days would lengthen into weeks, weeks into months, and months sometimes into seasons or even years, with still no occasion to speed the parting guest.

Your local committee knows how greedily we accepted your cordial invitation to come to Denver, but none of you can know how anxiously we waited for this hour, the time when we should really be here. I say "we," meaning what is left of us—for some who, like us, looked forward gladly to this occasion, have since gone into a farther country, and we mourn their absence. But here we are, some of us higher up than in our modest moments we ever expected to be—transported, as it were, by your cordial words of welcome into the seventh heaven of contentment and joy.

We come to you bringing the record of our past achievements, an honorable record, contributing to the upbuilding of a great profession devoted to the amelioration of human suffering and the uplift of our brother man. We come to enact in your midst and partly for your edification the deeds of the hour and the day, the natural consequences of the labor of those who have gone before, and of those who have worked and waited. We come to say, perhaps not the final word on anything, but the most hopeful and helpful word that has yet been uttered. We come with minds alert, with open hearts, thrilled by your oratory, melted by your cordial welcome.

We of the South are not unmindful that it was W. G. Russell of Georgia whose pick first turned up to the light of heaven that "saint-seducing gold" that has helped to make Colorado famous. We of the East know that in the beginning of this great state our representatives were here in the forefront of every contest. Indeed, from whatever section we come, we all have a special interest at stake here in Colorado. The entire country has had its eyes focused upon you while the struggle for supremacy was going on between the public service corporations and corrupt politics on the one side, and the people on the other. In the last engagement the people, led by that doughty little fighter, Judge Lindsay, seem to have had the advantage.

One battle does not decide the war, of course—indeed it bids fair to be a long and bitter one; but soon not only Colorado but all the states will be engaged in the same fight, and it will be a fight to the finish. Its duration cannot accurately be foreseen, but no one can fail to see to which side ultimate victory will come. Denver may be slightly inconvenienced now by shortage in her water supply, but this momentary annoyance will pass and all things belonging to the great city of Walt Whitman's dream will yet be here:

The place where a GREAT CITY stands is not
the place of stretched wharves, docks,
manufactures, deposits of produce merely,
Nor the place of ceaseless salutes of new-
comers or the anchor-lifters of the de-
parting,
Nor the place of the tallest and costliest build-
ings, or shops selling goods from the rest
of the earth,
Nor the place where money is plentiest,
Nor the place of most numerous population.

Where the city stands with the brawniest
breed of orators and bards,
Where the city stands that is beloved by these
and loves them in return and understands
them,
Where children are taught to be laws to
themselves, and to depend on themselves,
Where equanimity is illustrated in affairs,
Where speculations on the soul are encour-
aged,
Where women walk in public processions in
the streets the same as men,
Where they enter the public assembly and
take places the same as men,
Where the city of the faithfullest friends
stands,
Where the city of the cleanliness of the sexes
stands,
Where the city of the healthiest fathers
stands,
Where the city of the best-bodied mothers
stands,—
There the GREAT CITY stands.

We thank you for this cordial welcome to your great state and city.

Dr. W. T. Chambers of Denver, vice-president from the West, was then called to take the chair.

Dr. CHAMBERS. The next order of business is the reading of the President's address. It is with great pleasure that I present to you our president, Dr. BURTON LEE THORPE of St. Louis.

Dr. Thorpe then read his address as follows:

PRESIDENT'S ADDRESS.

I would be remiss indeed on this occasion, did I not give expression to my grateful appreciation of the high preferment so unanimously and generously conferred upon me by my *confrères* at the last session of this body.

To you who participated in conferring this, the highest honor at the gift of this great profession, the origin of which is distinctly American, I extend my sincere thanks;—as I also do to the secretary, the section officers, and the local committees, for the excellent work they have done in making possible this meeting.

Meeting as we do in this great section of the West, whose citizenship has contributed so much to supplying the bone and sinew of the nation—meeting, too, in this delightful city so near the Alps of America, amid God and nature's handiwork, "where the snow mountains lift their amethyst and sapphire crowns of splendor far and nigh," surrounded by a panorama of which it is truly said, "No artist's brush, no pen can ever describe the majesty of this mountain scenery that must ever remain uppermost and ineffaceable in memory";—under these delightful and inspiring auspices, there is to me but one thing to mar the pleasure of this reunion, and that is the absence of our friend and co-laborer, the late Dr. James Young Crawford, whose recent death casts a shadow of sadness over this occasion. Possessing marked executive and organizing ability, he was a valued member of numerous dental societies, a member of the committees on organization of the Second and Fourth International Dental Congresses, and twice elected president of the American Dental Association, a faithful attendant of it, and largely responsible for the fusion of that association and the Southern Dental Association into this our present National body. His genial presence and sage advice will be missed in our councils. As wine warms one's blood and love warms the human heart, so did the spirit of devotion to his profession predominate his career, overshadowing all else except his devotion to his family.

A GOLDEN ANNIVERSARY.

This occasion is an auspicious one, for at this time we celebrate the golden anniversary of the organization of the American Dental Association, the immediate predecessor of this association, the preliminary meeting for the organization of which was held at Niagara Falls, August 5, 1859, and the first regular meeting at Washington, D. C., July 31, 1860. The time seems propitious to briefly review the accomplishments of the past half-century.

Organized when jealousy and aloofness were paramount, schools few, and our literature meager, our profession has so developed in scope and character that none who have the interest of our calling at heart have reason to be ashamed of our professional achievements and progress. From our National association has evolved the present systematized collegiate course, largely owing to the National Association of Dental Faculties, also the present dental laws, mainly due to the efforts of the National Association of Dental Examiners, both being the offspring of this parent organization.

As a profession dental surgery has received the recognition which it so justly deserves from the American Medical Association, which in 1881 recognized our specialty as a distinct branch of the healing art and our people as being entitled to membership in that association. Fifty years has seen two distinct specialties evolve from dental surgery, viz, "oral surgery" and "orthodontia." The United States government has given us also signal recognition in the organization of the army dental corps.

Many foreign countries have recog-

nized our high standards in education by sending their students to America for dental training. They have also paid tribute to our scientists and writers in adopting American methods of operative procedure and in translating our text-books into many foreign languages.

THE F. D. I. MILLER MEMORIAL.

Of recent date the Fédération Dentaire Internationale has paid honor to the memory of W. D. Miller, the late lamented and world-famed dental scientist, whose contributions to his chosen calling were given so generously to his fellows, and who did so much to give our profession caste in foreign lands, in establishing the Miller memorial, the first prize from which was appropriately awarded to G. V. Black.

MEMORIAL TO HORACE WELLS.

Another expression of regard for the contribution to science of an American dentist took place on the United States Square, Paris, France, March 27, 1910, when our appreciative foreign *confrères* unveiled and presented to the city of Paris a statue monument of Horace Wells, the discoverer of surgical anesthesia by the administration of nitrous oxid.

AMERICAN MILLER MEMORIAL.

The Ohio State Dental Society has inaugurated a movement to erect a bronze statue of W. D. Miller in their capital city. This memorial is a laudable one and should have the liberal financial support of every American dentist, for all are beneficiaries of Miller's scientific research.

OUR STANDING.

From various sources we hear of efforts made to belittle our standing as a profession, and of attempts to merge it into stomatology, as a branch of the medical profession.

Prior to 1839, Hayden and Harris failing to get the recognition of the medical faculty, who snobbishly and strenuously opposed the organization of a dental training school as an adjunct to the medical department of the University of Maryland, with the excuse "that *the subject of dentistry was of little consequence* and thus justified their unfavorable action," as a last resort organized the dental profession as an independent specialty of the healing art. As such it has proudly continued for the past seventy years, and so, I predict, shall it stand indefinitely, when its critics shall be forgotten in the twilight of tradition, and have been swallowed up in the thick night of oblivion.

As a profession, dentistry has made immense strides both in self-culture and in benefits to humanity, all attributable to the purpose intended for it by its founders, viz, to properly educate its practitioners in the science and art of the conservation, treatment, and repair of the human teeth and their dependent structures, *i.e.* jaws, pericemental membranes, and gum tissue. In this, American dental training has led the world. The dental graduate is better prepared on leaving college than any other specialist of medicine, because all his training has been calculated to achieve one aim. A comparison of results between our college product and that of countries where the M.D. degree only is required for practice will clinch the argument for special dental training. If the choice of an intelligent public be an admissible criterion, then the American D.D.S. has scored a signal victory in all countries whose practitioners are required to be M.D.'s. By no means is our present system of dental education perfect, for no education ever was or ever will be perfect, but we are headed in the right direction, and constant furtherance along the present lines will result in the best possible achievement. Before medical men undertake to instruct dentists, they have much to learn. They must consider the teeth and jaws from a different viewpoint and modify the inadequate and often incorrect treatment of the same as indicated in medical text-books.

What has the medical profession con-

tributed to the solution of the saliva problem? Nothing. What can the average M.D., in particular the obstetrician, offer in etiology and therapeutic measures in regard to the pathological condition of the mouth accompanying pregnancy? Nothing.

Furthermore, credit is due to our specialty when we realize that it has received no support from its so-called "mother science," and has arisen phœnix-like and has fully developed itself in spite of the ignominies cast upon it by medical men, who in the past did not take the dental school under their protecting wing on account of their appreciation of our specialty, but because the dental department could be turned into a factor of financial support to the medical department. In return for this, the dental student was permitted to occupy the back seats in the lecture-hall and assimilate the crumbs of medical knowledge.

Whenever there was an opportunity for discrimination the medical student received the benefit, because the other fellow was only "a dental student." And now, why is it that we clamor for medical recognition and are so eager to ape their ways? We have no need to be ashamed of our standing, or to cater to the medical profession. Our degree is "inferior" only because "no one knocks the dentist but the dentist." Our detractors all are of the self-centered "holier than thou" type. Our degree is a badge of honor and culture indicative of special training. After all, the degree counts for little; it is the man and his knowledge behind the degree, for each man is master of his destiny, and he alone is responsible to his *clientèle* for the rendering of the high-grade service due them, and for his social standing in the community in which he practices his vocation.

Stomatology is a freak specialty, because it endeavors to embrace syphilology, rhinology, surgery of the head, dental surgery, the treatment of tuberculosis, and, in fact, of all lesions which find any expression in the oral cavity and the adjacent pneumatic sinuses. I call it a freak specialty advisedly, because it encroaches on and tries to deal with diseases which in the natural evolution of medical science have become specialties. It has been suggested that the dentist of the future shall bear the same relation to the stomatologist that the optician bears to the ophthalmologist. A more absurd idea is rarely offered to a thoughtful audience.

For the majority of dental operations no order or prescription can be made out. Most operations upon the teeth, moreover, must be judged in the same light and category as the surgical operations performed upon the eye. For they require the same fine technique and judgment as the most intricate surgical operations performed upon any organ of the human anatomy, the only difference being that dental operations but rarely involve the question of life and death. The dental surgeon does not deal with fatalities. And it is but human that operators upon organs whose health is highly important to the life of the individual will stand relatively higher in the estimation of the general public. However, this need not be construed as a degradation even by the hypersensitive or morbidly vain—for, "Act well your part; therein the honor lies!"

OUR NEEDS.

While the majority of our colleges are doing excellent work, I know I am touching an acutely sensitive nerve when I call attention to the lamentably low standard of some of our present-day collegiate institutions, which with their meager teaching facilities continue to foist their graduates on the unsuspecting public. We need alike more manual training and more thorough instruction in the fundamental scientific studies.

The dental college faculties associations now require graduation from a four years' accredited high-school course. If to this be added four years of study in a dental college, the first two of which years are devoted to fundamental teachings in mechanics and science, and the last two years to special dental training, the graduate in dentistry will be the peer

of the graduate of any other profession. Most medical colleges now demand as a minimum for entrance two years of study in a college of liberal arts. Graduates of dental colleges requiring a preliminary education of a four years' accredited high school course ought to have their three years' dental course recognized as the equivalent of the two years of liberal arts training for entrance to medical schools.

DENTAL EDUCATIONAL COUNCIL OF AMERICA.

In April your president was asked to appoint five members to represent the National Dental Association to co-operate with five members each of the National Association of Dental Examiners and the National Association of Dental Faculties in creating the "Dental Educational Council of America," the object of which is the advancement of dental education and the unifying of the standards of the various national bodies of the dental profession; to inspect the various colleges under their jurisdiction with a view of ascertaining the character of work done, and whether the needs of the community in which colleges exist are fully satisfied; to perfect a model curriculum and make a study of the existing dental laws of the various states, and present a report on the possibilities of more uniform laws. Your president selected Drs. J. V. Conzett, Richard Summa, Louis Meisburger, Howard E. Roberts, and A. R. Melendy to represent the N. D. A. on this council, with the hope that they may assist in bringing about the ideals proposed, which will result in giving our schools a higher standard and placing our profession where it rightly belongs.

REORGANIZATION.

At this session it was proposed to reorganize this society on broader lines, making its scope and character more representative, thus extending the field of dentistry and rendering more honorable service to the public health. The matter of the proposed revision of the constitution and by-laws has been under consideration for two years.

On account of the meager and unsatisfactory responses and evident disinclination on the part of the various state societies to accept the proposed plan of revision, it seems to me that it would be the part of wisdom to defer action for another year, and in the meantime invite all state societies to send representatives to a conference meeting to be called before the next annual session, and thereby endeavor to formulate changes and modifications which will receive the approval of the various state organizations and the profession generally.

Threats have been made by some that, if this society is not reorganized according to the plan of the American Medical Association, a rival association will be the ultimate result. Such disloyalty to this society seems absurd and should be condemned. I viewed with extreme interest the inner workings of the American Medical Association at their recent annual meeting, and found that like most organizations, it was pregnant with so-called "politics" and dominated by a few. In the history of all organizations this has always been and probably always will be. The speaker contends that the organizer and parliamentarian who devotes hours of work to the details and management of a society and eventually assists in promoting those who have executive ability, is as essential to the success of a society and to professional advancement as is the scientist, essayist, and clinician. After all, the most beneficent political institution human ingenuity can devise is the right man in the right place. Whatever the outcome of reorganization may be, the majority should rule, and the minority should graciously accept the decision and put its shoulder to the wheel and unite in a harmony of action and with fraternal good-will in making our National Association one compact body. There is room and work for all elements. Let each do his duty faithfully to his profession, and let us American dentists unite and have only one great National Dental Association. If we do this, then the words

of Theodore Roosevelt in closing his recent Romanes Lecture at Oxford will be applicable to us as individuals: "To each of us is vouchsafed the honorable privilege of doing his part, however small, in that work. Let us strive hardily for success, even if by so doing we risk failure, spurning the poorer souls of small endeavor who know neither failure nor success. Let at least the satisfaction be ours that we have carried onward the lighted torch in our own day and generation. If we do this, then as our eyes close, and we go out into the darkness, and other hands grasp the torch, at least we can say that our part has been borne well and valiantly."

Chairman CHAMBERS appointed as the Committee on the President's Address: Drs. Edward C. Kirk of Philadelphia, Richard Summa of St. Louis, and J. G. Fife of Dallas, Texas.

The PRESIDENT. Dr. C. C. Allen of Kansas City was to be present at this session and present a paper on "Professional Opportunity." This paper will be presented and read by Dr. J. D. Patterson, on account of the enforced absence of Dr. Allen, who on last Wednesday was operated upon for appendicitis, and has since been in a critical condition in the hospital. As a compliment to my friend Dr. Allen, I have requested the Executive Council to allow his paper to be read at this time, with the consent of Chairman Barber of Section II. I now present Dr. J. D. Patterson of Kansas City, who will read Dr. Allen's paper.

Dr. Patterson then read the paper by Dr. CHAS. CHANNING ALLEN of Kansas City, viz, "Professional Opportunity."

[This paper is printed in full at page 1079 of the present issue of the DENTAL COSMOS.]

Discussion.

Dr. CHAS. S. BUTLER, Buffalo, N. Y. It is not an easy task to discuss a paper that is pitched in so high a key as Dr. Allen's. The response, however, is made easier by the fact that the pitch is in the major and not in the minor key. In any discussion of a paper of this character, all that we can hope to do is to carry a little farther some of the suggestions or ideas that have been presented by the author.

There are two thoughts in the paper to which I want to call your attention: First, that our profession begins with the life of him who is to follow it. If this be true, how important becomes the training of the child along such lines as shall the most perfectly fit him to become a professional man. This shows at once the burden of responsibility upon the parent, and we are glad to recognize that in these days the parent is coming to feel that a greater responsibility for the future of his child than has heretofore been assumed lies upon him. This means, you will see, not only the intellectual training of the child along proper lines, and a technical training that shall fit him for the profession in which he may afterward engage, but also the development of a high moral conception of duty and of his relation to his fellow men as he advances toward the goal for which he is striving.

I am not one of those who feel or believe that we are inferior to any of the other learned professions in appreciation of the value of high moral and ethical training. I think we are at least on a parity with them in that regard. And yet I am sure it would be the testimony of every one here that we have not yet attained the highest possible development of the young men and the young women who enter our profession along the line of moral and ethical ideas of which they are capable.

The other thought in the paper which to me seems fundamental to us is the necessity of having some one or more things outside of our vocation in which we should be interested. It is impossible for any man or woman to be well developed physically if the physical training is to follow along one line only. It is equally true that development only along the line of our professional work produces, not symmetrical characters, but characters narrowed and dwarfed and confined within the limits of that one

line of development. So it becomes necessary, if we are to be developed intellectually, morally, and professionally into all-round men and women, we should have something other than our professional work to which we may turn in our hours of leisure and recreation. There are just three things, it seems to me, outside of recreation in the way of physical exercise, that are of supreme importance: First, a love of literature and a pursuit of the best thoughts of the best writers of our own and other ages; second, a love of art in all its forms; and third, a love for music, which is the very highest expression of art.

There is nothing in all the world, to my mind, that keeps men and women sweet and lovable like a devotion to these three things. The man or woman who can always have a song in the heart, who can always have a thought of the beautiful whether expressed or unexpressed, and whose mind is constantly dwelling upon the very best thoughts that are preserved to us in literature, is the most useful and therefore the happiest man or woman to be found in our complex society of today. When I speak of a love of music, I mean a love for that song of life which should always be pitched in the major key. Of course we must remember that there is and perhaps must always be among the unfortunate in life a song that is not in the major but in the minor key, and it is the great privilege of men and women situated as we are to sing to them of those happier, brighter, and more beautiful things in life.

It has been said, "The human in use barely pays expenses, but the divine pays dividends." And that is the thought of the essayist when he sets before us those things which are so important, and above all are so valuable, not only to us as individuals, but to all those with whom we are associated in the great pilgrimage of life.

THE F. D. I. MILLER MEMORIAL.

The PRESIDENT. The chair now recognizes Dr. Truman W. Brophy of Chicago, who desires to make a statement concerning the Miller memorial.

Dr. TRUMAN W. BROPHY. The president has taken me somewhat by surprise by asking me to come to the platform at this time. I must say now what I desired to say at this convention, namely, that the members of the dental profession of the United States have seen fit to join in a great international movement which was inaugurated two years ago by the International Dental Federation (Group I), in session in Europe, for the purpose of establishing a permanent memorial to the memory of the late Dr. Willoughby D. Miller, late dean of the Dental Department of the University of Michigan. It is well known that Dr. Miller was an indefatigable worker along dental lines, and did more, perhaps, in his time to place our profession on a scientific foundation before the world than any other one man. Dr. Miller, as you know, closed his life before his work in assuming the deanship of the institution named was really begun.

The fund that is being collected for this memorial, has already grown to about $12,000. It is intended, as you doubtless know, to make use of the interest on this fund to assist in carrying on scientific work along the lines that he pursued.

As the president informed you in his address, the first prize awarded by the members of the committee, made up of members of the dental profession representing all countries holding membership in the International Dental Federation, was awarded to the distinguished American, Dr. G. V. Black of Chicago.

America has not done her part in subscribing to this fund, as we have less than $2000 in the general treasury. The state of New York has taken the lead. When called upon they agreed to raise $1000, and actually raised $1100, the money having been paid in. Illinois has raised $1000, and we hope to have the fund raised to at least $5000. The president has permitted me to come before you to say that we wish to make up at least $2500 in this meeting of the association before it adjourns. I cannot see

how any man who has had the benefit of Dr. Miller's teaching, who has learned through his work the real origin of caries of the teeth, can afford to permit this fund to be finally closed without making some kind of a contribution. I trust that these good people of the central West who have not up to the present time made contributions will come forward and make a liberal subscription to this fund, not only individually, but from their state societies. Let us do this for the greatest scientist the dental profession has ever developed. His remains lie in the state of Ohio, but his fame is the world's treasure.

Dr. F. O. HETRICK, chairman of the Clinic Committee, announced the order of clinics for Wednesday morning.

The general session then adjourned until Wednesday at 12 o'clock noon.

(To be continued.)

NATIONAL DENTAL ASSOCIATION—SOUTHERN BRANCH.

Thirteenth Annual Meeting, held at Houston, Texas, May 4, 5, and 6, 1910.

(Continued from page 999.)

THURSDAY—*Morning Session.*

The meeting was called to order at 9.30 o'clock on Thursday morning, May 5th, by the president, Dr. Chace.

The reading of the minutes of the last session was, on motion, dispensed with.

The President announced the appointment of the following committees:

On Necrology—Drs. Guy Morgan, J. W. David, and H. C. Hassell.

On Resolutions on the death of Dr. Crawford—Drs. J. G. Fife, J. T. Meadors, and G. S. Vann.

On Revision of Constitution and By-laws—Drs. B. Holly Smith, A. R. Melendy, and V. E. Turner.

Dr. MASON moved that the papers presented to the association at this meeting and not represented by the authors thereof be read by title and published in the Transactions.

The motion was carried.

The next item on the program was the report of the Committee on Oral Hygiene, by Dr. J. P. CORLEY, chairman, as follows:

REPORT OF COMMITTEE ON ORAL HYGIENE.

Gentlemen,—The committee appointed to work with your chairman were unable to serve. The selection of a new committee delayed matters so that it was late when we got to work.

Our first move was to hold a committee meeting in New Orleans early in February for the purpose of organizing and mapping out a plan of campaign. The entire committee was present, and all the deliberations during the two days' session were concurred in unanimously.

We reviewed the work of the Committee on Oral Hygiene of the National Dental Association, indorsed it with congratulations to its chairman, and resolved our committee into an auxiliary to the National committee.

We determined to follow the general plan of campaign proposed by the National committee in so far as local conditions and our resources would permit.

Our committee proposed to undertake to establish hygiene headquarters in one representative city in as many of the states in the Southern territory as we

could reach during the present administration. To this end the chairman was commissioned to visit these cities and endeavor to get the local societies to undertake the work of organizing their cities after the Cleveland plan. This plan consists in making a dental inspection of all the public schools, delivering a course of lectures in the schools, and establishing and maintaining a free dental clinic where all the children of the indigent poor who are public school pupils can have free dental service.

We also made out the program for two sessions of the present meeting, an afternoon literary session and an evening public session having been promised by the president.

We indorsed the tooth-powder formula proposed by the National committee, and also its promulgation in such a way that the association would derive a revenue to be used in promoting the cause of oral hygiene.

An appropriation of funds and equipment by the National committee placed at the command of the Southern Branch committee to be used in their campaign was accepted with a resolution of thanks to the chairman of the National committee.

Chairman Corley was assigned work with the "local societies." Committeeman Walker was assigned the "public school" feature. Committeeman Towner was asked to present the preparation of the "dental student," and Committeeman Griffis was requested to study the "state boards' part" in the work of oral hygiene. The time has been short, and our resources have been limited, but we are pleased to report satisfactory progress in all these departments of the great work.

Your chairman has visited six local societies in five of the Southern States, and explained the details of the propaganda. All of these societies enthusiastically indorsed the plan, and recorded their intention of undertaking to put it into practical operation. A conservative opinion at the present time permits of the prophecy that they will all make good.

There is a general awakening in the medical and dental professions to the paramount importance of prophylaxis. In order that humanity may acquire immunity from disease the scientific prophylactician has determined upon a propaganda of popular education. To do this most quickly and economically it must be done through associated effort.

It is our desire to see all hygiene educators in the country associated under the leadership of the Hygiene committee of the National Dental Association. The present administration of that committee has made a showing that will inspire the confidence and secure the co-operation of every association in the country.

It is the intention of the committee to submit at the Denver meeting a plan whereby every section of the country can be efficiently and systematically reached with the gospel of Oral Hygiene. It is the opinion of your chairman, and I think the entire committee, that your committee should be officially declared an auxiliary to the National committee with directions to work under their general instructions.

The proceedings of the National committee have been published from time to time in the journals, and I assume that you are all familiar with the details of their campaign. It is to be hoped that this association will officially indorse their work. The opening of the National Oral Hygiene compaign under the able management of Chairman Ebersole, at committee headquarters in Cleveland, Ohio, in March, was the biggest event that the profession has ever witnessed, and it marks a new era in the practice of dental science.

Your chairman has had the good fortune to have had associated with him three of the ablest men in the Southern Branch territory, and wishes to embrace this opportunity to eulogize their self-sacrificing devotion to the cause of popular dental education. They are all present, and each has two contributions to the literary program and also something for the clinic.

Your chairman also wishes to thank President Chace for his very generous appropriation of two sessions of the pro-

gram to the subject of hygiene. His enthusiastic support has also been a substantial encouragement to the committee.

At the close of this evening's session we wish to submit a number of resolutions for your consideration as addenda to this report.

Respectfully submitted,
J. P. CORLEY, *Chairman.*

Dr. CORLEY. It is the desire of the committee that this report and the papers on this subject be read and discussed as a whole.

The first paper was that by Dr. W. M. GRIFFIS, Paris, Texas, entitled "The State Association's Part in the Oral Hygiene Propaganda," as follows:

THE STATE ASSOCIATION'S PART IN THE ORAL HYGIENE PROPAGANDA.

We are glad to see at this meeting the section on Oral Hygiene given a sufficient and prominent place on the program. There is no subject in connection with the profession of medicine or dentistry that is attracting the attention of the public so much as that of oral hygiene. Not that it is a new subject, but we are beginning to awaken the public mind to the fact that a clean oral cavity and normal healthy teeth are very essential to good health. As a state society we want to shoulder our part of this great work of educating the public in the proper care of the teeth and mouth. Out first efforts along this line began two years ago. A committee was appointed in charge of the work, and we realize that some good has already been done in a small way.

Now that the National Dental Association has more fully outlined the work and better plans have been advanced, we hope to soon accomplish a great deal more. Our state association is thoroughly convinced of the fact that there is a great work to be done, and it has already appropriated some funds for its support in carrying on the work, and will probably contribute much larger sums as they are needed. We are now making the purchase of a sufficient number of lantern slides, which will be useful in giving lectures to the public. We are glad that at this meeting one evening has been set apart for the public, and I hope that it will demonstrate to our body the great benefit of having such lectures in connection with our meeting each year.

We have also a number of wide-awake local dental societies that can assist greatly in this work, and we hope that others will organize. We trust that they will create hygiene committees and appoint some good local practitioner who will frequently use the lantern and the slides that the state association will furnish upon request for the purpose of such lectures.

In conclusion, I will state that this association means to keep abreast of the times and let its watchword be—"Keep pure the mouth, the gateway of health."

The next paper was that by Dr. JUSTIN D. TOWNER, Memphis, Tenn., entitled, "Preparation of Undergraduates for Teaching Oral Hygiene to Their Patients and the Public."

The report of the Committee on Oral Hygiene and the above papers were discussed together, as follows:

Discussion.

Dr. L. P. ROBERTSON, Marlin, Texas. I do not think it would be wise to take up much time in the discussion of this report and the papers, for the reason that they cover the ground so well that no further discussion is necessary, and besides, we have a great deal of other business to attend to.

This work is certainly a very laudable undertaking, and it is very gratifying to see the interest manifested in it. A very broad field is opened to us, calling for sacrifice and co-operation.

I have only one suggestion to make in regard to this work. Probably some of you will remember the report made by Dr. Thompson, nearly two years ago, at the joint meeting of the Maryland and District of Columbia societies, in which

he suggested that this work should be undertaken early in life—that is, we should begin with children early in life, study their environments, and give proper information to the teachers in the schools, colleges, and universities. If we hope to create an interest in this work, it is necessary that we should begin at the beginning.

Although this subject has been agitated for years, we have succeeded in doing very little.

Since it is going to take much of the operator's time and much money, both of which are difficult to secure in the state of Texas at least, I should suggest to have adopted by the state text-book board suitable text-books on physiology to be used in the public and normal schools. That is as far as we have any legal authority to go in this matter. The physiology text-books differ in the teaching of oral hygiene. The physiology books used in the public schools are rather technical, and in the public schools in Texas this work is terminated in about the sixth grade. I would therefore suggest to have committees appointed from the state dental and medical associations to meet jointly and to study and prepare matter for a physiology text-book that we can have adopted by the next board.

The reason why the physiology text-books used in the Texas schools have been so poor is simply because no better ones have been offered to them. The members of the board realize the importance of this subject, and if we will only present a proper book, I feel sure that it would be adopted.

I have another suggestion to make, as to a means of raising a revenue for carrying on this work. We know that when a text-book is adopted by a state board it is a great asset in the way of revenue to the publishing house that issues the book. There is one book that I have in mind that has been worth more than a hundred thousand dollars to one special house. If we could by some plan have a proper text-book adopted by the whole nation, or by individual states, and reserve the right to a royalty on that book, I believe we could get a good revenue for carrying on this work. The author of this book should not receive any revenue, but should render his services from an unselfish standpoint.

I believe that when this work is started in that way it will be of great benefit for the future generations, and will be more successful than it has been in the past.

Dr. J. P. Gray, Nashville, Tenn. I wish to add a word on this subject, particularly with reference to the text-book. Tennessee, in my opinion, leads in that respect. Here is a little pamphlet containing some of the ideas that we had incorporated in the last text-book adopted.

I do not believe that it would be advisable to attempt to collect money from the publishers of the text-book. But your board can possibly be induced to adopt a chapter to be placed in a text-book. The book referred to contains a very useful chapter, and we had but little trouble in having it incorporated. It is being used in schools by seventy-five thousand children, and we are beginning to reap some benefit from it.

I disagree to a certain extent with Dr. Towner's and Dr. Corley's conception of this work. I believe that one of the first things to do is to begin with the instruction of the children, or rather of the teachers and then of the children, as I believe we could reach more people in that way. It is difficult to obtain the privilege of getting at the children and doing this work. You will also find that dentists are very enthusiastic soon after the work begins, but when it has gone on for a while they will begin to be very busy in their own offices, and as a consequence will not attend to this work.

Dr. Corley tells me that he can examine two mouths in one minute. He cannot examine one mouth in two minutes, nor in three, successfully. I am not speaking against this work, but about where it should begin. We will have to spend some money in the preparation of the articles which we wish to have put into the text-books, and should be glad to have them incorporated, whether we

get any revenue therefrom or not, to begin the work of education. The dentists of the town must go before the teachers, give them lectures and get them interested enough so that we shall be permitted to examine the children's teeth. Did you find that to be the case in Cleveland, Dr. Corley?

Dr. CORLEY. They hired men to do that work.

Dr. GRAY. You are not going to be able to hire men to do that work. In Ohio you may do it, but in Virginia a law has been passed that a dentist must have the M.D. degree before he can be registered, and when we get to that point we may be able to do that. I am ready to do my part, as far as the work is concerned with children. We sent out and invited the people to bring the children to the clinics, and we were willing to do that work, because we can teach a child how to take care of his mouth. While I am to a great extent in accord with Dr. Corley's method, I wish to emphasize that we have to lose sight of the personal benefits to be derived from this work. In reality, ninety-five per cent. of the dentists are doing this work for their own benefit largely.

We must lose sight of the personal benefit to be derived from this movement, and it should be impressed upon the public that it is for the benefit of the children. There is no question that it will benefit us in time, but why not keep this to ourselves! The newspapers in Cleveland at the time when the Oral Hygiene Congress was being held there, said that the dentists were formulating plans to extract more money from the people. We must educate the people for their own benefit, beginning with the teachers.

Dr. A. G. FRIEDRICHS, New Orleans, La. We have heard a great deal of oral hygiene at this meeting, and I believe the work that has been done is commendable, but in my opinion the only way in which we can do this work is by first educating the physician, who must impress the importance of this subject on the mother. The foundation of all this matter, so far as the teeth are concerned, is laid at a period in which the physician has entire charge, and it is his duty to call the attention of the mother to the teeth, and, from the child's infancy, begin to care for them. We do not see these children until later. This work of oral hygiene is very important, but children cannot get these ideas into their heads. The consequence is that when they have grown beyond a certain age great damage has already been done. Therefore the mothers should be called together for public lectures, as they are the ones to look after the children. Of course, it would be well to give the teachers instruction so that they can teach the children and chart their mouths. They should insist that the children present certificates as to hygienic mouths, and that no child shall come into the public schools unless his mouth is in a healthy condition.

I made the proposition to the school authorities in New Orleans that we chart all the children's teeth in the city. We offered to take care of the teeth of those who could not afford to pay for the work, and also suggested that the board pass a resolution insisting that no child come to school unless his mouth be in a healthy condition. We of course instantly ran up against the ignorance of the masses. Our proposition appeared to them as a matter of graft; they could not understand how any man could be inspired by altruistic motives, and thought that we must be stimulated by some personal advantage to be gained.

In Germany and in France, as in any portion of the United States, the law is enforced that no child shall be accepted in the public schools without presenting a certificate of vaccination. If the authorities can demand that, why not the other? We all know that contagious diseases are more often transmitted through the medium of the mouth than in any other way.

Dr. J. P. CORLEY, Greensboro, Ala. I wish to say at the outset that some years ago Dr. Gray and myself came to an agreement that we would always take opposite sides of every issue. Dr. Gray made a rather serious accusation this morning as to my methed of securing the co-operation of the profession in this

work. He said that I have put it on a mercenary basis, and have held up to the profession the reward of remuneration. In this Dr. Gray was mistaken.

I have been visiting schools throughout the country and speaking to dental students, most of whom have entered the profession for the sake of making a livelihood. It would be illogical to assume that such an audience of students could be appealed to by the altruistic, scientific spirit which we hold out to Dr. Gray and the older men. These students have not yet developed the ideal of professionalism, which is a product of development, like the training of the fingers, or the eyes, and the rest of the human mind and body. I have usually wound up my appeal to that class of hearers by stating that, if the gospel of hygiene were carried throughout the land, the field of dentistry would increase nine hundred per cent. and the dental offices throughout the land would have nine times as many patients as visit them today, and the dentist would thereby reap a financial reward. Now, I submit it to you whether I have committed treason by laying that proposition before such an audience of students.

Another question of logic is involved here. Dr. Gray has said in the same breath that ninety-five per cent. of the dentists could not be reached by any other method than through their pocketbooks. If that be the case, and if we expect to see the day when this gospel of hygiene will be popular, we shall have to secure the co-operation of some of these ninety-five per cent. by holding out the hope of reward in dollars and cents. I am accused of being an idealist, but I have to be a little practical as I go along. We were told yesterday that it is difficult to raise money for this movement because the majority of dentists do not expect a good return from it. The other five per cent. are still struggling along, trying to convince these ninety-five per cent. Dr. Gray advised to begin this campaign with the teachers. We will go back a little farther than that, and begin with the dentist who has to teach the teachers. These ninety-five per cent. of the profession that Dr. Gray referred to are hopeless; you cannot teach an old dog new tricks. So we have to begin with the dental students.

At the request of the National Association I took up the work with the colleges, and this year, so far, I have visited eighteen of the colleges in the United States and have spoken to the students, and to the faculties when they were not too busy. We have made requests of the faculties for innovations. I realize that, as a profession, we are indebted to these men chiefly, but as with all men of accomplishments, it is difficult to convince them that they are lacking in some respects. We have asked them, "Do you believe in having inspection in public schools?" They said, "Yes, the public ought to have that." Then we have asked, "Do you have your students' mouths inspected?" "No." "Are you willing to request the students to have their mouths examined?" "We will, if they want to." Then we asked, "Won't you go a little farther, and require them to do it? Will you keep a record of this and send it to the National committee, who want to know the condition of the mouths of these students? And then will you have their mouths examined once a month from that time on, and will you require that before they are graduated their mouths shall be free from cavities, perfectly hygienic, without diseases of the gums?" We did this to put the work on a practical working basis—and I want you to guess how many faculties said they would pass that regulation. There was one college that did not have to enforce this regulation, the students volunteered to do it, and the faculty agreed to it. This regulation is surely going to be adopted in all our schools.

We have also appealed to the National Association of Faculties. We went before the examining boards in every state, and said, "When men apply to you for license, will you inspect their mouths, and, if their mouths are filthy, if they have unfilled cavities, if they need dental attention, will you turn them down? Will you not say to them, 'We cannot commission you to go out and represent

a scientific profession and preach a gospel that you do not practice in your own person'?" That request is not an idealistic dream; it is a practical measure, and is going to be universally adopted.

There is a great deal of truth in Dr. Friedrichs' remarks in regard to the medical profession, but how are we going to teach the medical men? We have to teach the dentist before he will teach the medical man.

Referring to Dr. Walker's paper of last night, I want to commend the work that is being done in New Orleans, involving an enormous expense to the men engaged in it. I know men in this audience who have spent more out of their own pockets this year than we asked you for yesterday as an appropriation from the Southern Branch. There has been a lot of discussion with reference to the wisdom of lecturing to children. We have been old so long that we have forgotten the receptivity of the child's mind, of which we have had practical illustrations. We have cases on record to show that they profit by such lectures. They go home by-and-by and induce their mothers to buy tooth-brushes for the whole family.

About a month ago I lectured at the high school in Birmingham before an audience of 865 pupils and 32 teachers. I brushed my teeth on the platform, and showed the children how it should be done. That afternoon a half-dozen boys saw me on the street, and said, "Hello, doctor, are you still brushing?" Soon after that, in that same school, when one of the teachers asked the class to give an example of teaching by illustration, ten of the class gave my example of brushing the teeth. Dr. Friedrichs has either overlooked it, or has not been informed as to how we are proceeding with lectures. We have three sets of lectures—one for the pupils, one for the mothers, and one for the general public. I know that in Cincinnati they have lectured to forty-four mothers' clubs. We are inviting the mothers to come, and induce them to teach their children to come. So we are educating the mothers as well as the children, the physicians, and the dentists. One of the most hopeful features of this work that I have seen so far is the fact that the dentist is learning to brush his teeth. The time has been that when an old friend rushed up to you at the annual convention and said how glad he was to see you, you would have to smile and back off to keep from feeling nauseated. The most hopeful feature of the situation, in my opinion, is that the dentist is brushing his own teeth, and is also learning to brush the teeth of his children.

In reference to Dr. Griffis' paper as to the duty of the state associations, I may say that we are getting the state associations in line. Ten years ago I put the proposition of giving lectures before the Alabama society, and a committee was appointed to carry the idea through, but it died right there. We want to have subsidiary or auxiliary committees in every state association. We have such auxiliary committees to the National in Alabama, in Tennessee, and in several other states, to assist in securing the cooperation of these states. Every state society should maintain a committee, and have one public session of the annual program devoted to this work.

As to Dr. Towner's paper on the teaching of oral hygiene to dental students, we first requested the faculties to require every senior to write an essay on this subject, and deliver it before the senior class, and then we requested of the students that they explain the dental toilet to their patients.

This movement is growing. It must be remembered that this is the first year that it has been thoroughly organized for consecutive work, and we could not have succeeded this year if the movement had not been financed in a small way by the Dental Manufacturers' Association.

Dr. W. H. Henthorn, Loraine, Texas. This campaign must be conducted in such a way as to make the parents realize the necessity of dental hygiene. The physician does not pay a great deal of attention to his own teeth, much less does he go to the trouble of teaching parents the necessity of taking care of

their children's teeth. In the cities more attention is paid to hygiene than in the rural districts. The children are never allowed to come to the table with dirty hands, but it is not so in regard to the teeth, although it is much more important that the teeth should be kept clean, since it is in the mouth where the function of digestion begins. If we can get the public to realize that it is necessary for them to keep the mouth and teeth as clean as the face and hands, we shall have made a long stride in the progress of hygiene.

These principles must be taught to the mothers, the teachers, and also the physicians. Of the five physicians in my town, only one has a set of teeth fit to look at. The physicians as well as the parents must be taught in regard to oral hygiene.

There are various ways in which to increase the practice of dentistry, but this is one of the best that I know of—that is, teaching the parents and the children the necessity of taking care of their teeth. I clean teeth every day in my office, and teach my patients to clean their own teeth. The other day a very well dressed and handsome young lady came into my office presenting teeth that were in a horrible condition. I extracted one molar that had been broken off and found that the gums and roots had entirely separated. The gums were so swollen that they covered the teeth. I began treating the gums, and now the patient's mouth is in a fair condition. After extracting the tooth, I told the patient's mother what was necessary in regard to the teeth, and impressed upon her the necessity of the daily cleaning of the teeth in order to preserve these organs and prevent disease from spreading.

We must devise some plan by which we can have the teachers of the schools teach their pupils the necessity of taking care of their teeth, and also teach their fathers and mothers. In the country they have public exercises every Friday, which a great many parents attend. If the dentist could on these occasions instruct the mothers, the fathers, the teachers, and the pupils, we should accomplish a great deal of good.

Dr. J. E. Storey, Beaumont, Texas. We must start at the root of this matter. If we elect men to our legislature who will enact the laws necessary for our needs we shall then begin in the right direction. You notice that the legislature of Texas has already recognized the fact that a sanitary condition is needed on the trains, and today we are able to clean our teeth in a different vessel from the one in which we wash our face and hands. Yet they do not recognize the fact that such measures are as necessary in the schools as they are on the trains. They know that disease is spread by the mouth, that more disease enters through the mouth than in any other way. I am satisfied that half the amount of bacteria that we find in the human system enter through the mouth, and, if the mouth were kept clean, half of the tuberculosis we have today would not exist. It should be a matter of pride for us to elect the proper men to our legislatures, and so have the desired laws enacted.

Dr. Corley. Ten years ago we undertook to have a text-book adopted by the Alabama Senate, but the chairman of the Senate, when approached on this subject, said, "Son, how much money have you got?" Of course we had none, and the chairman of the Senate informed us that the school-book concerns had a lobby in the capitol which had back of it all the money they wanted, and suggested that if we had no money we had better not waste our time on that proposition.

Dr. W. E. Walker, New Orleans, La. I wish to compliment Dr. Towner on his paper. It was very complete; only one aspect of the subject was omitted, that of diet. I failed to hear him state that the students should be taught the feeding of children, and the hygienic care of babies, that they might teach the mothers.

Dr. Friedrichs remarked that children were unable to comprehend this subject. This has not been my experience in New Orleans. I am afraid that he is not sufficiently serious in addressing children. It is true that some dentists have not the

ability to impress children, yet it does not take oratory or gymnastics to interest children, and, owing to their receptive minds, we can do more with them than we can with their mothers.

As to a revenue from text-books, that cannot be relied upon. The effort to inspect the mouths of children in the public schools made by Dr. Friedrichs was not the first of its kind. Nine years ago I made a similar proposition, which was turned down. There seemed to be no disposition on the part of the authorities to have the children's mouths examined, because of a lack of education in hygiene; but they are coming to it. They see that we are working for the public, and our superintendent of public instruction and his associates are in favor of a clinic if we can secure for it the best practitioners of the city—but not students. They are now hearing our lectures, and they have pronounced these lectures—and I claim no credit for this myself as four others are engaged in this work—the most instructive ones in the course of fifteen or twenty public lectures given by physicians and educators.

As to any profit that might accrue from this work, I am really surprised and disgusted that the material side should be thought of. My own bank account is about fifteen hundred dollars less than it would have been if I had not taken an active interest in this work this year. As to Dr. Corley's suggestion that education of the public along this line would increase the profession's revenue, I think that is an effect that would be very temporary, to say the least. That it might stimulate the public not only to clean the teeth and mouth, which is our aim, but to visit the dentist, may be true incidentally, but the *ultimate* result, in my opinion, would be the curtailment of the amount of money spent by the public with the profession—greater health and economy for the public, and less money for the dental profession. Many practitioners are rather afraid to enter a movement which has for its object the education of the public to the point where they will not need our services. Nine-tenths of the professional service we render today would be entirely uncalled-for if the public would prevent the necessity for it, and that is what we are after—the prevention of both disease and deformity.

Twenty-seven years ago the Southern Dental Association took an active part in this work by indorsing a little book entitled "Letters of a Mother to a Mother on the Formation, Growth, and Care of Children's Teeth," and since that time more or less work has been done in this field, but in those twenty-seven years no president has seen fit to give to the Oral Hygiene Committee the fair deal that the present president has given us.

Dr. Corley (closing the discussion on his paper). I wish to make the final plea that you all take a personal interest in this matter. The question is such a large one that we have not grasped it all. The more we study it the more we see its possibilities. Every once in a while some new star rises above the horizon, throwing out its transcendent glow on the earth, and showing some new field that this work leads into.

With regard to the question of remuneration, I realize that there will be fewer fillings to make, fewer irregularities to correct, and by-and-by there will be such a state of immunity from dental disease that our offices would be little more than advisory bureaus. We would realize less reward from mere patchwork, but by-and-by we would come to realize the highest privilege of professional life, and that would pay more than ordinary repair work.

We are trying to secure literature to send to the schools throughout the country; we are trying to introduce our lectures on the chautauqua platform, and in the parochial schools, and to secure the co-operation of the legislatures and the newspapers. Dr. Gray forgot to tell you the status of the newspapers in Cleveland that spoke unfavorably of us. All the intelligent people of the city as well as the better class of newspapers indorsed the work, and, as you have heard, we had an audience of five thousand people on the 18th of March at the inauguration

of this movement. I want to tell you further that there is a newspaper in Atlanta which requires that every carrier have a tooth-brush and use it. I want to defend the newspapers, as the intelligent ones are among our strongest supporters. Of course there is a "snide" element in newspapers that we will have to overcome, just as in dentistry, but the better class of papers are glad to take up the work. I have been treated with great courtesy by them generally. The time will come when the associated press dispatches will carry throughout the land news of every important meeting of men who are working for the benefit of the community. Of course there are a lot of newspapers which will have to be educated up to the importance of this work; all of this is a matter of education, and I realize that it cannot be perfected in a day. But don't let us be discouraged; let us wait until next year and see what progress will have been made. If every dentist in the land were as enthusiastic as Dr. Gray this movement would have already been carried to perfection. Let us keep on in this work! I hope you will pardon me for being so emotional in this matter. I have spent my whole life in it. Dr. Gray said before an intelligent audience recently, "This work is pulling Dr. Corley down; he has aged ten years in the last four, and is a poorer man today than he was then."

Before the session adjourns, I hope this association will take some official action on the work of the Hygiene Committee of the Southern Branch. We have only given you a foretaste of what we have in store for you. We are not going to abandon the work, but we wish you to take some official action in one way or another, in order to uphold the hands of the Oral Hygiene Committee. Some teachers and some of the biggest journals of the land have thrown obstacles in our way instead of helping us, and these and other things are making it difficult to carry on the propaganda, but there is to be a crisis at Denver this summer, when the National Association will take action in some way.

Dr. J. D. Towner, Memphis, Tenn. I want to call your attention to the necessity of dental inspection beginning in the dental schools. Dr. Corley has aptly said that the whole movement is a matter of education. It is education wherever you begin, whether with the student or with the infant. In my paper I said that, and laid special stress upon the education of the adult to the requirements of oral hygiene. I referred to the fact that the work of oral hygiene should begin with the infant instead of with the adult. In his preparation for work in this field, the undergraduate has to have practical experience, and in order to further that end the inspection has necessarily to be made by him, not only that he may familiarize himself with the necessity of the order of the inspection, but that good may come of it for the person inspected. This problem is being met in as practical a way as possible. We have inaugurated inspection in our schools, and generally the condition of the mouth depends to some degree on the understanding of the students. They are given to know that, and a record of each mouth is made, not only of the defects but of the good conditions, and a record is also kept of the use of the brush, etc. The student and the dentist must have clean mouths before they can tell others how to keep theirs clean. In my final examination I gave the class ten very practical questions, and in the eleventh question I embodied the whole field, viz: State in your own way your idea of the importance and opportunities of teaching oral hygiene. I wish I had some of the papers with me to read some of the answers given to that question. Half a dozen of these answers would make an intelligent paper to be delivered before this association. I felt very proud of the replies. Some of them were sermons, and it makes my blood wax warm to know that in that way the results of my efforts are appreciated, and the necessity of this work is so fully recognized by the student. In this year's work not one reference has been made to the financial side of it, and never will be, for it is placed upon a humanitarian, altruistic basis, where it

must stand if the student and the practitioner would do their full duty.

The preparation of the student is all-important, and by student I do not mean the undergraduate only. We are all students, else we stagnate. Unless we progress, we retrograde. We must educate the student, who in turn must educate the public to a proper realization of the importance of this movement. I am very proud in one respect, and sorry in another—proud of the men who by their teaching are uplifting the nation; sorry, that the dental profession has stood aside, waiting for these good men to give their money to preach a gospel which we have all been supposed to practice. We must hold up their hands, if we can do nothing else. It has been a gratification to me to observe the interest that has been manifested in our work by this association. While we are co-laborers with the National Committee on Oral Hygiene, we have done our work in the South. We have made sacrifices because we felt we had the support of the Southern Branch of the National Dental Association. We are working for you and with you, and we want your support and commendation. Nothing more spurs the energy of a man than the recognition of what he has done. We have not done this work with an idea of remuneration or compensation, but are simply asking that you not only commend the efforts of the present committee, but lend your support to the incoming Committee on Oral Hygiene. Stand by them, and they will do work of which you will be proud.

It seems a shame that at this late date we should begin the teaching of dentistry where it should have begun in its inception. We have come to you emphasizing the fundamental principles of dentistry. Hygiene is not a specialty of dentistry or of medicine; it has a relationship to every branch of dentistry. I want to go on record as stating that any man who makes a public announcement of the fact that he is making a specialty of oral hygiene and prophylaxis —or, to state it more comprehensively, of the treatment of pyorrhea—is in my opinion very grossly deceiving himself or wilfully deceiving the public. The man who purports to practice hygiene of the mouth and sends his patient to the dentist for filling operations does that patient, the dentist to whom he refers him, and himself an injustice. Every dentist must himself make every operation in the oral cavity to create and preserve a hygienic condition.

The next paper announced by the President was one by H. A. Engelhardt, M.D., Houston, Texas, entitled "The Relation of the Diseases of the Nose and Pharynx to Dentistry."

[This paper is printed in full at page 1073 of the present issue of the Dental Cosmos.]

Discussion.

Dr. J. A. Gorman, New Orleans, La. The essayist's paper certainly gives a great deal of food for thought to the dentist.

One of the most important features the essayist emphasized, from the orthodontist's standpoint, was the importance of proper breathing, especially in infants. So many mothers, when asked if their child sleeps all right, will say, "Yes." Then if you ask them a few more questions, say, whether the child keeps the mouth open while asleep, they will say, "Yes, but what difference does that make?" They do not realize the importance of normal breathing for the child. One of the questions I ask in this connection is, "Would you drink water through your nose?" Of course they will say, "No." Then I tell them that it is no more ridiculous to drink water through the nose than it is to drink air through the mouth. The air with all its filth and germs goes to the posterior mouth and lodges on the tonsils, causing them to become infected; moreover the air is not properly warmed as it would be in going through the nose, to say nothing of the proper filtration. Too much stress cannot be laid upon the importance of proper breathing, especially in infants.

The essayist spoke of children having snuffles, or similar troubles. When at-

tention is called to this, the mother says, "Why, that is no more than Mary had" —Mary on investigation exhibiting a narrow arch and a small nose.

The essayist in my opinion did not lay enough stress upon the development of the mandible in mouth-breathing. In mouth-breathers we observe a lack of development of the mandible. The mouth is being kept open continually, and during the development of the rest of the bones of the face and head the muscles that hold the mouth open bring pressure to bear on the mandible, bringing about this arrest of development.

In regard to antral disease, I wish to ask the essayist how often he finds that associated with mouth-breathing.

A Member. I would like to ask the essayist if a man should not, especially in the country in the open air, wear a mustache on account of the sifting of the air? I have often thought of this since it has become so fashionable for men to shave their mustaches.

Dr. W. E. Walker, New Orleans, La. We are under great obligations to the essayist for his paper, which is very instructive.

I wish to ask the essayist to bring out a point in closing in connection with the etiology of adenoids. The etiology of antral troubles was touched upon, but the etiology of adenoids was not considered. I have consulted some of the rhinological text-books, and as far as I am able to ascertain we seem to be working somewhat in a circle. While adenoids produce mouth-breathing, is it not true that neglect of colds in the head, necessitating mouth-breathing in children have something to do with irritation of the tonsils and the production of adenoids? I wish to learn something on the etiology of adenoids from the essayist. Certainly this is an age of prevention. We wish to prevent irregularities and mouth-breathing, and as we can prevent these by the removal of adenoids, why not go a step farther and prevent the adenoids?

In this connection mention might be made profitably of the fact that we are not content in moving teeth buccally by simply tipping the crowns, as was formerly practiced by orthodontists, but for some time we have been able to move the roots and in that way get a better purchase on the bone so as to open the symphysis and widen the nasal fossa, the inferior meatus of the nose, to a much greater extent than results when simply the crowns are tipped buccally. I am glad in that connection that at last even Dr. Angle has recently admitted the advisability of moving the roots, even of the incisors, by illustrating an apparatus for bringing the roots out, after the crowns have been moved.

Dr. M. S. Merchant, Houston, Texas. I am glad that Dr. Engelhardt has called the attention of the dentist to the fact that it may be sometimes best to open into the antrum through the nasal cavity.

We dentists feel like boring in all cases through the alveolar process, but from consultations with rhinologists and examination of some of the cases treated by them, I find that they have succeeded sometimes where we have failed by going in through the nasal cavity. I am glad the essayist has chosen this subject, and I am in hopes that dentists will be more careful hereafter to consult with the rhinologist in cases of antral trouble.

Dr. S. M. Myers, Cleburne, Texas. I wish to ask if it is a fact that adenoids are caused in a great many cases by the silencers or hushers that mothers give to their little ones in order to keep them quiet? I noticed an article in a dental journal not long ago, written by a Frenchman whose name I have forgotten, in which this fact was mentioned. The author claims to have seen many children with deformed arches and adenoids due to the use of these hushers.

Dr. H. W. Lubben, Galveston, Texas. The essayist has fittingly called our attention to adenoids, mouth-breathing, and obstructions of the air-passages. It is almost impossible for the orthodontist to work properly on a patient who is afflicted with any obstruction of the air-passages. Whenever a child presents at my office for treatment of any kind, and I notice any obstruction in breathing,

I immediately advise the parent to have the child treated by a rhinologist. If the child is young enough, malformation of the arch and irregularity of the teeth will probably be prevented thereby and the child will get sufficient oxygenation to grow up in health and strength. I have treated children for troubles largely due to adenoids, or polypi, or misplaced septa, who, because they were treated in time, have grown up without any irregularities of the arches and teeth. The modern practitioner is realizing the very great importance of such treatment. At the present time the rhinologist has to be consulted every day. We have two in Galveston whom I know to be always willing to consult with the dentist on these subjects, as well as in cases of antral trouble.

With regard to antral trouble, as Dr. Engelhardt says, we must not forget the fact that there are other sinuses equally as important as the antral sinus, and when we treat a case of this kind unsuccessfully we should call in the rhinologist at once. I had a case of what I supposed to be simple empyema of the antrum. I treated it through the second bicuspid pocket to the best of my knowledge and skill for six weeks, and finally I called in a specialist. Two operations showed that not only throughout the antrum but also in the zygomatic fossa and the frontal sinus there were polypi, which had to be removed before a perfect cure could be obtained. The members of the profession, therefore, should never forget the great importance of the air-passages for the health of the mouths of children.

Dr. J. P. Gray, Nashville, Tenn. After examining several hundreds of skulls and making some dissections, I have found that we dentists do not know all the conditions to be observed in the antrum. The essayist speaks of the antrum presenting nodular formations. In a number of these cases I have observed seeming ridges extending throughout, so that if such an antrum were entered through the mouth, pus would be found in one of these divisions but the trouble in the other divisions would pass unnoticed. The average dentist drills a small opening into the process or around the teeth, and therefore in such a case would drain only one division. He should have an opening large enough for him to examine the entire cavity, and if necessary curet it. In the examination of these skulls I also found that an arrest of development had taken place in that region, and I believe that in most cases the trouble is due to arrest of development in the embryonic stage or later on at the various ages of stress in life. We know that during the first two years there is a great strain upon the health of the child if he is not being properly fed and treated. Then at six years there is another period of stress, and so on until he passes the age of twenty-one years. Such a period of stress may occur in the last three months of pregnancy, when great difficulty is sometimes experienced, and as a consequence this arrest of development of the maxilla takes place. The mandible is often involved, more particularly in mouth-breathing, the teeth maloccluding because of the arrest of development in the maxilla.

Dr. L. P. Robertson, Marlin, Texas. I want to commend the practical method by which the essayist operates in antral troubles. It has been the custom of a great many practitioners engaged in this work to merely make an opening, irrigate the cavity, and treat as in ordinary abscess, using hydrogen dioxid and all kinds of irritants, which, instead of doing good are doing harm. I am quite sure that in chronic cases with extensive necrosis, the method of making a large opening, curetting, and using iodoform powder is more excellent. In my experience I find this much better than irrigation, especially irrigation with strong solutions. If the cavities are irrigated at all, it should be done with mild solutions.

Dr. B. F. Thielen, Paris, Texas. I would like to ask if the essayist does not find that antral troubles often follow grippe. I have referred several cases within the past year to specialists, where I could discover no dental trouble whatever, and in nearly every one these spe-

cialists have found the natural opening of the antrum closed by the inflamed condition of the tissue of the nasal cavity, and sometimes the mere opening of this antrum gives relief. The sooner we recognize these conditions, and turn them over to the specialist, the better.

Dr. ENGELHARDT (closing the discussion). I am very glad that my paper has brought out such an interesting discussion, and I will endeavor to answer the questions asked.

Dr. Gorman asked about the non-development of the lower jaw. I think that abnormalities due to mouth-breathing, caused by the muscles which keep the mouth open, will in smaller children produce a malformation not so much in the lower jaw as in the maxilla, and that is why I laid so much stress on the maxilla.

In regard to the other question, as to how often we find mouth-breathing in comparison with antral trouble, I would say it is rare that we find antral trouble together with adenoids. We find antral trouble frequently in conjunction with obstruction of the nose, with ethmoidal or frontal sinus trouble. As my paper was directed particularly to dentists, and it was not my intention to bring out the nasal portion of the subject, I did not lay so much stress on that. I might say, however, that the dental origin is a very frequent one, because of the acute and chronic inflammations that go with dental troubles. Yet the nasal origin is more frequent, being due to infectious diseases, particularly influenza.

As to the question in regard to the mustache, I think that it has nothing to do with the filtration of air; the nose takes care of that. We find more bacilli in the nose than in any other part of the body, while hardly any other part of the body will heal so quickly as the nose.

The etiology of adenoids is a very much mooted question, which no one has so far answered satisfactorily. We have tried to find the cause, and various reasons have been put forth, such as temperature, climate, etc.; again others maintain that the climate has no influence. I believe adenoids to be due to the lymphatic condition of the individual himself. As a rule, children with lowered vitality are subject to adenoids. I think the prevention lies in hygienic measures, in improving the condition of adults and children of a low vitality, and securing for these children plenty of fresh air and good nourishment.

Dr. Merchant speaks of the nasal method of treating antral trouble. In some cases it is impossible to go through one sinus and thoroughly clean this cavity, because, as one of the gentlemen has said, the examination of skulls shows that many antral cavities are divided into separate partitions by the bony structures. I emphasized that in my paper, but it seems to have been overlooked.

One gentleman has asked if nipples or suckers cause adenoids. I do not think they do, though in my opinion they will cause a mal-development of the arch. We frequently, however, find a contracted arch forming in children who use them. I wished to bring out the relation of the mouth to the floor of the antrum. This is most important to the dentist, and also to the rhinologist. Very seldom does it occur that both sides of the antrum are alike in the same individual. On one side it may go just over on a line with the nasal fossa, while on the other it may dip into the alveolar process. Again, we may miss it in going through the socket of the incisor, as there is no antrum about the nasal fossa, because it bulges so far out. In other cases we cannot pass through owing to the thick bone between.

A MEMBER. Do I understand that if adenoids are properly removed, they do not return?

Dr. ENGELHARDT. Only in two per cent. of the cases.

Dr. WALKER. I would like to ask if failure to use the nose will not produce malformations in the oral cavity and pathological changes in the nose?

Dr. ENGELHARDT. You refer to the manner of breathing?

Dr. WALKER. Yes.

Dr. ENGELHARDT. I am sorry that I did not bring with me this morning a

case that I am now treating to show you the picture of a child with adenoids. When a child breathes exclusively through the mouth, the muscles of the nose are impassive, thus preventing the development of the nose. It therefore sometimes happens that, even after adenoids are removed, the child cannot breathe through the nose. To overcome that condition it is best to put on what I call a bridle. This holds the jaw in position, and the child is compelled to breathe through the nose, thus inducing its development.

The PRESIDENT. I desire to thank Dr. Engelhardt for his excellent paper. It has been very much appreciated, and I am sure that it will be a valuable addition to our published Transactions.

REPORT OF THE COMMITTEE ON NECROLOGY.

The next order of business was the report of the Necrology Committee, by Dr. GUY MORGAN, chairman, as follows:

We, your Committee on Necrology, beg leave to submit the following:

Whereas, The Divine Ruler has seen fit to call from us in the midst of their activities our beloved members, Dr. W. G. Whitsett, Dr. H. R. Jewett, and Dr. D. H. McNeil; be it

RESOLVED, (1) That in the death of these noble men our association has suffered an irreparable loss, and that we shall ever retain tender memories of their untiring efforts for the improvement and elevation of their chosen profession.

(2) That we mingle our tears with those of their friends and loved ones, and that we extend to their families our sincere sympathy and condolence.

(3) That these resolutions be spread upon our minutes and that a copy be sent to the family of each of these departed members.

Respectfully submitted,

GUY MORGAN,
H. CLAY HASSELL,
J. W. DAVID,
Committee.

Motion was then made and carried that the meeting adjourn until the evening session.

THURSDAY—*Evening Session.*

The meeting was called to order Thursday evening, May 5th, at 8.30 o'clock, by the president, Dr. Chace.

The President announced that the first item of the evening would be an address by Dr. J. P. CORLEY, Greensboro, Ala., on the inauguration of the present oral hygiene movement—which follows:

ORAL HYGIENE: INAUGURATION OF THE PRESENT MOVEMENT.

Mr. President, ladies and gentlemen, —Unfortunately the first speaker of the evening has not materialized, therefore what I have to say will not be intelligible unless I tell you some things that he would have said.

About ten years ago the National Dental Association, realizing the fact that the majority of dental imperfections come from an unsanitary condition of the mouth, determined upon a propaganda of popular education to the end that the public might become immune to caries of the teeth and diseases of the gums. In order to carry this work forward, they appointed a committee known as the oral hygiene committee. This committee was commissioned to go into the public schools of the land and instruct the teachers and pupils in the care of the teeth and mouth. The association, however, had no funds to place at the command of this committee. We undertook, nevertheless, to put the work into operation, by trying to engage the co-operation of the dentists throughout the land; and so we sent letters all over the country to men who were conspicuous in their associations and asked if they would go into the public schools and present the matter to teachers and pupils. I am ashamed to tell you what developed as the result of this invitation. We thought we should have no trouble in inducing our professional brethren to do this work without compensation, but we found that not one man out of ten would volunteer to do so.

There are a good many reasons for that attitude. It was not merely a matter of indifference; it was largely on ac-

count of the fact that the dental profession had not been taught to instruct the public in the care of the teeth and mouth; therefore we had no equipment, and there was none available. Neither had the profession at that time awakened to the possibilities of prophylaxis. We had not carried the gospel throughout the dental profession, and our practice was largely mechanical. We were really tooth carpenters, and saw no farther than reconstruction.

Our first purpose in a professional way was to reconstruct, to repair what had been destroyed. And so we have had a long, hard fight against heavy odds. We lacked co-operation, and we had little sympathy from the public. However, at the last meeting of the National Dental Association, in Birmingham—it was the first annual meeting, by the way, at which this committee was able to secure an entire session devoted to the subject —we held a public meeting. We had an audience of school teachers and physicians, as well as members of the association, and a number of papers and discussions on the subject were presented. As a result the Executive Council appointed a man of distinguished ability as the head of this hygiene committee, a man thoroughly in touch with the work which had been done, and who lived in the very center, you might say, of the hygiene work in the United States, Dr. W. G. Ebersole of Cleveland, Ohio. He went to work with his local society and engaged the co-operation of the newspapers of the city of Cleveland, approached the board of education, and with the co-operation of his local society secured permission of the school authorities to make an examination of the mouths of the children in the public schools of Cleveland. He also obtained permission to establish a free course of lectures in the schools of Cleveland, and as a last concession was permitted to establish four free dental clinics in four of the most prominent and largest public schools in that city. At these clinics all the children of the indigent poor can have dental attention free of cost.

The committee held a meeting last December in Cleveland, and mapped out plans for the campaign for the present year. We had a number of schemes whereby we might finance the work, because that was one of the greatest troubles. We were only partially successful in this respect, however, but we obtained enough money to enable us to create a little interest throughout the country, and on the 18th of March the opening of the national campaign on Oral Hygiene took place in Cleveland. At that meeting we had Dr. C. W. Wille of the hospital marine service, as personal delegate of President Taft; Dr. H. C. Brown of Columbus, as the personal representative of Governor Harmon; Ex-Governor Herrick of Ohio, and Dr. W. A. Evans, health commissioner of Chicago. The meeting was opened by the mayor of the city of Cleveland, an audience of five thousand people being assembled. A number of distinguished educators from throughout the land were present, together with probably one hundred and fifty dentists, who came from long distances and paid their own expenses that they might get in touch with the work as we had planned it.

The general plan consisted, first, of having dental inspection made in the schools throughout the land. In order to do this we shall have to work through the associations of the profession, and so we have planned to undertake to induce all of the associations to resolve themselves into auxiliaries to the National committee, and to undertake to have a dental inspection made in the public schools of their localities. Many of the state associations have volunteered to do this. A triple chart record of the conditions which they find is to be made, one to be given to the National Association's committee, one to the school board, and the third to the child, to be taken home to his parents. These charts show the actual conditions of the mouth.

The examinations which have been made so far show that between ninety-six and ninety-seven per cent. of the mouths of school children need dental attention.

After the inspection is made, the next

step is to establish a free course of lectures. These lectures are given also to the mothers' clubs of the city and community, and also to the public. There are three sets of lectures—one for children, one for mothers, and one for the general public. After these lectures, free dental clinics are established where all children of the indigent poor can have free dental attention.

The National committee has placed in my hands, as chairman of the Southern Branch Hygiene Committee, some funds, together with three clinical equipments to be used in this territory. These cost from $750 to $1000 each, and consist of a complete dental office outfit with the latest and most modern apparatus. Material is furnished, and each child is given a tooth-brush and a package of dentrifrice, and shown how to use it. This work is done in the local communities by the local society—that is, they give their time and the National Association furnishes the funds.

We do not propose to continue this work indefinitely; we cannot do it. We have been having a hard time to get it done for twelve months. Our proposition to the school boards is that we want their permission to go into the schools and do the work for twelve months free of any cost to the schools or to the city or to the taxpayers. At the end of that time, if we do not submit to them data which will convince them beyond the shadow of a doubt that they can afford to finance this enterprise themselves to a monetary advantage, then we will not ask them to undertake anything at all. The way in which we propose to show that this work can be rendered profitable to the school board is as follows: We get the school record for the previous year of each child that comes to the clinic. We ascertain how many days were lost owing to illness, and if possible the nature of the illness; we ascertain the grades of study, and also the deportment of the child; we secure the child's record during the time when he has had free dental treatment and make a comparison. We propose to show in this way that we will make a saving for the school board by cutting down the list of delinquents to such an extent that the board can afford to finance this movement. Last year in the city of New York seventy thousand public school children failed to make their grades, and consequently had to be carried over for another school year. That cost the city three million dollars. With what information we have at present we have established the fact that at least forty per cent. of the absences from school are due to faulty oral conditions, not simply common toothache, but conditions which have arisen as a consequence of unsanitary conditions of the mouth. We have also established the fact that the oral conditions have a direct bearing on the deportment of the child. A child suffering from toothache or from malnutrition cannot be expected to have the same good spirits and willingness to give and take as the one who does not have such an affliction. We have already shown this to be true, and that is worth something.

The school board of Birmingham had to establish this year three summer schools. Why did they do that? Because they had such an enormous list of delinquents that they decided it would be economy to provide summer schools in which these children could make up their deficiencies, and would not have to be carried through another school term. That cost the city of Birmingham seven thousand five hundred dollars. The superintendent of education of the city of Birmingham, in discussing this measure in the newspapers, said that he accounted for this large list of delinquents chiefly by illness, and that at least seventy-five per cent. of the list would have made their grades had it not been for the time lost on account of illness. So you see, gentlemen, that this work has a very practical basis. If we get this system inaugurated throughout the land, the time will soon come when the school boards will finance it, and the poor downtrodden dentist will not have to give his time for nothing. I want this information to go abroad for a good many reasons; first, to encourage the dentist to undertake this work for twelve months,

and second, to disabuse the public mind of the idea that we are after a job; and still another, to convince the school boards that we are acting in good faith.

This year I have visited on behalf of this association five or six of our southern cities as the guest of the local societies, and have given public illustrated lectures and explained the details of our plan. New Orleans, Atlanta, Nashville, Memphis, and Birmingham have agreed to undertake the work, and the matter is now up to the school boards. It is up to the local societies in each city to influence the school boards during the present vacation so that the work can go forward next winter. Lecture work has already been done in some of these cities.

We have had a long, hard, and unpromising fight, but the day is beginning to dawn. We have received encouraging letters from local societies and from individual men all over the United States, in Canada, in Europe, in Australia, and in England, asking us to furnish them with the details of the plan upon which we are working, and to give them information which they may use in inaugurating the work in their local communities and in their several countries.

We are just now getting out an equipment. You will find in the rear of the auditorium the first oral hygiene exhibit which has ever been presented in the South—and I started to say, in the world so far as I know, but I will not make that statement because the Oral Hygiene Council of Massachusetts has an oral hygiene exhibit; but this is the first one that has been built for this national campaign, and it was built for the Houston meeting. As it is the first of its kind you must not criticize its shortcomings, because it was sent down here for criticism and suggestions. This equipment was made by a manufacturing concern in Providence, and they are now working on an exhibit which has a mechanical arrangement for the manipulation of the tooth-brush, floss going over the teeth, and a toothpick picking particles of food from between the teeth, which will be added to the exhibit. These exhibits are still rather expensive, but as soon as we create a demand for them, and as soon as they can be made in large quantities, their cost will be reduced materially. Your committee also proposes to have made a standard set of lantern slides for the public lectures, and we have at present about two hundred from which to make selections.

I have been able to give only a very inadequate explanation of the situation as it presents itself today. At the next meeting of the National Association in Denver in July we propose to make this a national issue in the profession, and the action which is taken by the Southern Branch in Houston will determine in a large measure whether or not this movement can be carried forward to a success.

At the close of the exercises of this evening we want to submit to you for consideration a number of resolutions.

Following the address by Dr. Corley, a stereopticon talk was given by Dr. J. D. Towner, Memphis, Tenn., which was succeeded by the following

Discussion.

J. H. Foster, M.D., Houston, Texas. I wish to express my appreciation of the lectures which have been delivered to us this evening. Surely every one of us has gained much, and a great deal of good will arise from these lectures. I want to congratulate the association upon having men who devote their time and means to this splendid work of education. This work is very much in line with the work we are doing in the medical profession, and I know how hard it is to accomplish the results that we seek.

The development of the dental and medical professions is one of evolution, which is bringing the two professions more closely together, and I think in time they will be to a large extent merged. Both professions started primarily as arts, becoming sciences only later. Our work first called into use art in order to correct the effects of disease, and we learned by experience that certain measures would bring about good results in

these conditions. Later the work of scientific search for the cause of disease was instituted, and as they learned more about the causes of disease it dawned upon the members of the profession that a large amount of the suffering and disease that the human race suffered was preventable. We then came to the present era of hygiene and preventive medicine—the era in which more good work has been done than in all the past history of dentistry and medicine. As our professions have become more and more aware of the good that could be accomplished in this line, the results obtained have not been in keeping with the knowledge gained, for the simple reason that when we went to put this knowledge into effect we met with opposition due to popular ignorance. We professional men have been very slow to take a public stand. We have been too slow to put before the people our demands; we have been of a retiring nature, and it is only within recent years that we have felt that we were compelled to start a campaign of public education, and today we see good results rapidly coming.

In our own city, to some extent we have had examination of the schools. Today I was speaking of this subject with a nurse in the settlement association who has charge of the examination of pupils, and when I mentioned the fact that the subject was to be discussed tonight, she said, "You can tell the people that in the examination of schools here in the city we have discovered a larger percentage of dental troubles than anything else."

There is a bill before the United States Senate to create a department of public health, to have at its head a cabinet officer—the object being largely the prevention of disease. Senator Owens, who introduced this bill recently, showed that millions are expended every year for the treatment of preventable diseases, that millions are being spent by the state for the care of the sick who are subject to preventable diseases, and withal he presented a most masterly argument for the establishment of a National Department of Health with a cabinet officer at its head. Our popular magazines today are responding to the public pleas, and almost every month they publish articles dealing with preventable diseases. So, altogether, the public seems to be responding, and we may expect great results in the future.

Dr. Corley [reading]: "The school child whose mouth is unclean from decomposing food and stagnant septic salivary matter, due to indigestion, generally exhibits pus, exudations from irritated and inflamed gum margins, gaseous emanations from decaying teeth, putrescent pulp tissue, and chemical poisons. With every spray from such a mouth in coughing, sneezing, or even in talking or reading, the air becomes laden with microbes which are inhaled by others. Does the dental profession go beyond the limit of its province when it suggests that it is unjust to deprive the children of our schools of oral hygienic education, and as a result to continue to pay yearly toll to the death-rate from tuberculosis and other transmissible diseases to which the children of our schools are now subjected by forced predisposition?"

Dr. B. D. Brabson, Knoxville, Tenn. We have heard this great subject discussed freely today. I made a statement yesterday which it appears was misunderstood. I am not opposed to this great movement of hygiene, for I have made a study of this subject for ten years. I believe that prophylaxis is the keynote of dentistry; I believe that we will do more good in the future along that line than any other, and in view of this fact this subject ought to be given precedence over every other subject by every dentist in the world.

I move that this association vote $500 of its funds to this committee. I also move that we appropriate from $250 to $400 for the Journal fund, and be ready to report at the meeting in Denver, where the question will come up. It is proposed to issue the first number of the independent journal in October, and I know we all want to be loyal to it.

The motion was carried.

Dr. CORLEY. I put myself on record yesterday proposing that if the association would appropriate $500 toward this movement, I would undertake to raise $500 more at this meeting. The hour is late, and most of the audience have left, but I am going to undertake to raise $250 tonight, and to make up the rest tomorrow.

We want this money to be contributed by associations and not by individuals, and I am going to ask those who represent the state associations here tonight to pledge their associations for certain amounts.

The following members pledged the stated amounts for their respective associations:

J. D. Towner, Memphis—Tennessee	$50.00
H. C. Hassell, Tuscaloosa—Alabama	50.00
Julian Smith, Austin—Texas	50.00
W. G. Mason, Tampa—Florida	50.00
W. H. Henthorne, Loraine—Texas	25.00
A. B. Carter—Dallas	25.00
M. S. Merchant—Houston	15.00

Dr. CORLEY then presented the following resolutions:

RESOLVED, by the Southern Branch of the National Dental Association, That any man should be declared ineligible to hold office in the Southern Branch of the National Dental Association who does not maintain in his own mouth a perfectly hygienic condition.

RESOLVED, further, That no dental teacher should have a place on the dental faculty unless he maintains in his own mouth a perfectly hygienic condition.

RESOLVED, thirdly, That no man be allowed to be a member of a state examining board unless he maintains in his own mouth a perfectly hygienic condition.

The President ruled that such resolutions could not be entertained by the body under the present constitution and by-laws.

Dr. WALKER. Mr. President, let us then adopt a resolution to the effect that it is the sense of this association that no man is worthy of membership in this body unless he maintains in his own mouth a perfectly hygienic condition.

(No action was taken.)

Dr. CHACE. On behalf of the association and of the Committee on Oral Hygiene, I wish to extend our hearty thanks to those who have been with us tonight, and particularly the president of the local medical society, who has favored us with an address which was very much apprethetics."

Motion was then made and carried to adjourn until Friday morning.

(To be continued.)

CONNECTICUT STATE DENTAL ASSOCIATION.

Forty-sixth Annual Convention, New Haven, Conn., April 19 and 20, 1910.

(Continued from page 1031.)

WEDNESDAY—*Morning Session.*

The meeting was called to order Wednesday morning at 11 o'clock by the president, Dr. Brown.

The first order of business for the session was the reading of a paper by Dr. NORMAN S. ESSIG, Philadelphia, Pa., entitled "True Art in Dental Prosthetics."

[This paper is printed in full at page 1066 of the present issue of the COSMOS.]

Discussion.

Dr. C. Frank Bliven, Worcester, Mass. It is certainly very encouraging to all of us to have listened to this excellent address and to know that there are men growing up in our communities who have taken up work of this kind. For if our profession has been behind in anything, it has been so in this direction. There are, of course, some men so constituted that they can do both the artistic and the mechanical work, but there are a lot of men who can do good artistic work but not good mechanical work, or *vice versa,* and in the future I think the well-appointed office will have both the mechanical and the artistic man, who, together will be capable of producing natural results. I doubt not that some have been successful in this respect, but it is utterly impossible for me to get any satisfaction out of a laboratory man in carrying out any ideas of this kind.

The essayist spoke of men ordering teeth in sets of a hundred. A number of years ago I had a talk with one of our prominent dental manufacturers in an attempt to secure teeth that I wanted. He took me to the counter and showed me a set of small teeth of a certain number—I cannot remember the number now, but they were small white teeth—and said: "Down on Tremont street we have a customer who orders every month one hundred sets of these teeth, and as long as we can supply him with that number and keep our business going, we are certainly not going to spend much time with men like you." That was the encouragement I received twenty years ago along this line of work.

As to porcelain block teeth, I have been able many times to select what I wanted in the color of the gum and also of the teeth, but not the size, and by adding porcelain to them and re-baking I have been able to obtain very good results. As my clinic which I am going to give this afternoon is concerned with this subject, it will perhaps be just as well to speak on it now. Unfortunately, my assistant left out some work of this kind done twenty years ago, and I have with me only just a few specimens that she happened to pack up for me. I trust you will not criticize this plate, as it was selected from an old lot. On one side of the plate [demonstrating] you will find the teeth as they are usually set up. On the other side a little staining work was done, demonstrating the possibilities in reproducing the effects that we find in elderly mouths. On this card [demonstrating] beginning on one side, you will find a slight change made in one of the molars, so slight that you would hardly detect it. To one of these two bicuspids [demonstrating] a little pink gum has been added. The other is the natural tooth; it also shows where there has been a slight erosion. This canine [demonstrating] is from a case that came under my treatment some fifteen years ago. The patient, a lady, had what we call Hutchinson's teeth, and on that canine a crown had been put, which was a beautiful piece of ceramic art, but wholly inappropriate for her mouth. She wished to know if I could not in some way change that crown so that it would look more natural. I made this [demonstrating] as a trial piece and showed it to her, and afterward replaced her crown with one like it. The lateral shows a slight imitation of a check in it. The central is a reproduction of a deciduous tooth that we sometimes see, with white spots. This kind of work certainly offers a broad field, and I regret very much that I am unfortunate in not bringing with me my best specimens. Some of them were shown before the Connecticut Valley Society some eighteen years ago, and it is very encouraging to find now and then in different localities men who have taken up this work. In regard to taking models of the mouths of patients who will lose their teeth eventually, I think every dentist should take them, especially for patients who appreciate a realistic reproduction of their teeth. If a dentist is not able to produce the desired result himself, he can select a man in or near his locality who can, which is a creditable procedure on his part that will add to his reputation for honesty and liberality,

and advance the high ideals that should be the fundamental principles of every man practicing dentistry today.

Dr. Henry McManus, Hartford. Privately, for a good many years I have said that when I would be in position to stand up and say "twenty years ago," and have it carry probable conviction, I would be on my feet at dental meetings talking most of the time. That anniversary passed in February, and I now am in position to carry out my intention. That in a measure accounts for my presence here today, but my principal reason for coming was to hear what my friend Dr. Essig had to say.

Dr. Norman Essig's father, in my opinion, was the first man to make the prosthetic branch of the dental profession respectable.

When I broke into the dental profession "twenty years ago," the men who made rubber plates did it in an obscure section of their laboratory, principally to pay their rent. The dentist was ashamed of the fact that he did such work, and only made plates from force of circumstances. After scraping rubber for six months in Dr. Hitchcock's office, I went to Philadelphia with the intention of avoiding such work in the future. I had the good fortune to know Dr. Essig's father, and he taught me the error of my ways in about eighteen minutes, and since that day I have devoted all the time possible to the manufacture of artificial dentures, and had I acted entirely on my own volition I would have done nothing else. To me the replacing of teeth for people who have been so unfortunate as to lose them is the most vital and important work that the dentist can do.

When we fill teeth, whether with gold, amalgam, porcelain or gold inlays, we are simply doing patchwork, and I think you will admit that however well a filling may be put in, sooner or later, if the patient lives long enough, it must be renewed. When we make and insert a set of teeth we have accomplished an end in life, and we have done that which at least has given us an excuse for living, and to my way of thinking the prosthetic dentist today is gradually coming into his own. He is the dentist that really accomplishes results.

I feel firmly convinced that there is no more beautiful example in the world of commercializing art than that characterized by the dental profession today. We wander about from pillar to post, and have taken up every passing fad and fancy, and we have sat and listened, and in some instances taken part in windy discussions on how to raise the standard of the profession by educating the public. We do not need half as much to educate the public as we need to educate the dentist to doing good honest conscientious work—and I think, when we say honest conscientious work, we mean of necessity, if English words mean anything to us, artistic work—and the one function in which dentistry should be more interested than in anything else is the replacing of the organs of mastication. All that patients care about is to have their friends deceived into the idea that they have retained their natural teeth, and to accomplish this we must go to the byways and hedges and take what we find and remodel it to fit each individual case.

Some of the specimens which Dr. Essig has made are absolutely marvelous, and I think the work the father started is going to be carried out to its proper conclusion by what the son is doing today. Personally, I wish to offer the essayist my thanks, and I almost feel emboldened to offer those of the profession for the work he has accomplished.

Dr. Essig (closing the discussion). I do not wish to add anything in closing the discussion, except to thank those present and the members of the Connecticut Society for their kind attention, their interest, and their hospitality extended to me during my stay in New Haven.

Under the head of miscellaneous business—the communication from the National Dental Association being read, proposing that the Connecticut Society become affiliated with the National, and that its transactions be published in the National journal—Dr. James McManus

moved that in view of the uncertainty as to what could be done by the National in this respect, and what the outcome of the proposed new journal would be, the communication be laid on the table and be taken up next year.

The motion was seconded and carried.

The communication from the Miller International Memorial Fund Committee by Dr. Brophy, chairman of the International fund, was taken up, together with that submitted by the National or Columbus Fund, submitted by Dr. Mills.

After considerable discussion, Dr. McManus moved that the society appropriate $100.00 to the International fund, and $50.00 to the National fund.

The motion was duly seconded and carried.

Dr. F. T. Murlless, Jr., presented the following amendment to the by-laws, with regard to increasing the membership of the association:

To Article IV, Sec. 1 of the By-laws *add the following:* The initiation fee and dues for two years shall be remitted to all newly licensed practitioners who shall make application for membership in this association within one year of the time of the granting of license to practice.

The President announced that the amendment would lie over for one year, and final action be taken at the next meeting.

Dr. James McManus. There is a subject that I would like to call the attention of the society to, one which has interested me for years, and one to which I referred in a paper that I read some years ago; that is, that a benevolent association be formed in this country for the care of dentists who have lost the ability to work, similar to the one which has been in operation in England for several years. I would suggest that the association start a movement by which we could have a dental benevolent association in this state.

Election of Officers.

The Nominating Committee then submitted the following report:

President—Dr. F. T. Murlless, Jr., Hartford.
Vice-president—Dr. R. H. W. Strang, Bridgeport.
Treasurer—Dr. H. A. Spang, New Haven.
Secretary—Dr. E. J. Abbott, Waterbury.
Librarian—Dr. F. G. Baldwin, New Haven.
Editor—Dr. I. B. Stilson, Stamford.
Executive Committee—Dr. C. H. Riggs, Hartford, Chairman; Dr. A. V. Prentis, New London; Dr. Geo. B. Palmer, New York city.

Motion was made and carried that the report be accepted, and that the president be empowered to cast the ballot of the society for the list of nominations as presented.

Dr. Murlless was then conducted to the chair and duly installed as president for the ensuing year.

Dr. Hindsley moved that the thanks of the society be extended to the Dental Cosmos and to Dr. Anthony for his services in reporting the convention.

Motion carried.

Dr. James McManus moved that the thanks of the society be extended to the essayists and clinicians who had taken part in the meeting.

Motion carried.

Dr. Charles McManus moved that the thanks of the society be extended to the retiring officers for the excellent meeting just held.

Motion carried.

There being no further business before the society, motion was made and carried to adjourn until the next annual meeting.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Forty-second Annual Meeting.

(Continued from page 1013.)

Dr. R. G. Hutchinson, Jr., New York, presented a paper entitled "What Constitutes a Cure of Pyorrhea Alveolaris, and How May It be Accomplished?"

Dr. Hutchinson. I might preface my remarks by stating that the conclusions I have arrived at have been prompted simply and solely by clinical observation, and are based on cases that have come under my care. I am therefore merely relating occurrences and am not theorizing. Though I may seem to be making some very positive statements, I feel it perfectly right to do so, because my experience has been quite a wide one, and I can believe nothing inconsistent with the results I have obtained.

The essayist then read his paper, which is here printed in full, as follows:

What Constitutes a Cure of Pyorrhea Alveolaris, and How May It be Accomplished?

During the season just drawing to a close, in all probability more attention has been given to pyorrhea alveolaris and oral prophylaxis than to any other subject which has been presented at our society meetings or in our dental journals.

GENERAL INTEREST OF THE PROFESSION IN PYORRHEA.

It is because of the great interest manifested in and the immense importance of the subject that I feel justified in presenting it again for your consideration. During the past year it has been my privilege to address ten different societies, including the Dental Society of the State of New York, regarding pyorrhea and its treatment. In every case the interest manifested has been most gratifying and is indicative of a better comprehension of the subject than has ever before existed among the rank and file of the dental profession.

THE QUESTION OF THE CURABILITY OF PYORRHEA.

Scores of men have demonstrated that complete and permanent cures may be effected, and the erroneous notion that pyorrhea is an obscure and incurable disease is rapidly being dispelled from the minds of both the profession and the laity. Notwithstanding this fact, the great majority still believe it to be incurable, and progress is being seriously hampered by the influence of those who persistently refuse to believe what some of us well know to be true.

This attitude has existed for many years, in spite of the fact that some practical men have made every effort in their power to teach and demonstrate its error. The fact that the majority of men have failed in their efforts to cure pyorrhea has had greater weight than the successful efforts of the few. Failures prove nothing but the inability of the operator to accomplish that which he attempts, when success is seen to crown the effort of even one man who undertakes the treatment of a like condition.

DR. G. S. ALLAN'S PROPHETIC VIEWS ON THE CURABILITY OF PYORRHEA.

Twenty-one years ago, Dr. George S. Allan of New York read a paper, which was printed in the December 1889 issue of the *International Dental Journal,* in which he expressed opinions which are exactly in accord with those held by many men today who have reached their conclusions after careful clinical observation. It has been my privilege to be with Dr. Allan frequently of late, and he tells me that he "has not yet had reason to change his opinions one iota." And yet he was ridiculed and denounced at that time by some of the foremost men in our profession, whose opinions have been accepted as gospel truth.

I wish to quote a paragraph from Dr. Allan's paper to show what he then believed. He was many years in advance of the time. Dr. Allan said:

> Nine cases out of ten, at least, that come into my hands have the same story to tell of how they had thought a cure, or even relief, was impossible, for their dentists had told them there was no hope, the trouble being constitutional—in their blood—and nothing could be done. More professional crimes are committed in this department of our practice than in any other I know of, for I hold that it is a crime for a dentist, to whose professional skill and care a patient commits himself, to offer him ignorance where he expects knowledge, and mislead him as to his chances and opportunities for a cure.

This was written twenty-one years ago.

DR. J. D. PATTERSON'S VIEWS.

Of late, many others have expressed similar views, notably Dr. J. D. Patterson of Kansas City, Mo., in a paper published in the *Dental Summary* for May 1909, in which he says, relative to the belief that pyorrhea is of systemic origin and therefore incurable:

> This condition of things—in which, to my mind, we find the greatest deflection from professional duty at present known to the dental profession—has been on account of misleading or false teaching by those who are considered authorities, and these teachers are *particeps criminis* in the loss of thousands of dental organs which would have been saved and have ministered to comfort and beauty, if we had not been taught that little could be done for pyorrhea, as its cause was systemic. . . . On account of false teaching, dentists all over our broad country —good operators, too—are telling their patients: "Nothing can be done." "Eventually you will lose your teeth." "It is constitutional," etc. These statements absolutely and positively have been proved to be untrue by many operators, who in thousands of cases have proved that if all local irritations are removed and sanitation is established, cure or perfect comfort comes, *whatever phase of faulty metabolism exists.* And that in every case—if treated ere the tissues become so hopelessly involved that the teeth are nearly exfoliated—improvement comes rapidly and positively.

SERIOUS HARM ACCRUING FROM THE BELIEF IN THE INCURABILITY OF PYORRHEA.

I give to these sentiments expressed by the authors of the foregoing quotations my heartiest indorsement, for my own experience for years has proved them to be absolutely correct. No good ever has or ever will come from the belief that pyorrhea alveolaris is incurable. Patients who are taught to believe such a statement will naturally refuse to undergo treatment, and so are deprived of the benefit that might have been derived from treatment. It makes no difference if the dentist expressing such an opinion considers it beneficial to treat pyorrhea; for if the patient believes there will be a recurrence in spite of all that may be done, and that he will ultimately lose the teeth, he probably will not consider it worth while to endure the pain or pay for such treatment. I have frequently been told by patients that some friend of theirs, at their solicitation, had intended to have treatment for pyorrhea, but had abandoned the idea because the dentist had told them that it was constitutional and could not be cured. No man has the right to deprive his patient of a benefit because he either cannot render the service or is ignorant of the fact that it can be rendered. It is folly for anyone to say that a thing can

never be done because he has never seen it done.

A CURE NOT EQUIVALENT TO IMMUNITY.

Some men, although they believe in the efficacy of surgical treatment, and succeed in restoring and maintaining a healthy condition of the mouth, still maintain that somewhere in the system pyorrhea continues to exist, and therefore it is not cured. They are undoubtedly honest in this belief, but is it logical?—and is it not productive of evil results? Such men would brand as an impostor one who would declare a healthy mouth to be affected by pyorrhea when there never had been such a condition. Why, then, should they refuse to acknowledge that a cure has been effected when a condition of health has been established and is being maintained? Webster defines cure as "A healing; the act of healing; restoration to health from disease, and to soundness from a wound." This is what can be and has been accomplished thousands of times in the treatment of pyorrhea alveolaris.

It in no way alters the fact that a cure has been established if a recurrence should take place; for if the original causes are again given sway, a recurrence of the disease may be the result, unless immunity has been established.

A PARTIAL CURE NO CURE.

It is not fair to demand the establishment of immunity as a proof of cure. This test is not applied in other diseases, and should not be applied in a case of pyorrhea. What is generally considered as recurrent pyorrhea is not a recurrence, but a continuance resulting from incomplete treatment, and is certainly evidence that the case has not been cured. A semblance of cure may be effected by partial treatment and be maintained under favorable conditions by prophylactic treatment or medication, but what I consider a cure is the restoration to health, with a constantly increasing degree of tone and resistance even when frequent prophylactic treatment is not carried on, and without recourse to any constitutional treatment whatsoever, either of a systemic disorder or by establishing immunity through bacterial inoculation.

A PRACTICAL TYPICAL CASE OF CURE.

To illustrate, let me cite a case from my practice:

About eight months ago Mr. M., of about forty-five years of age, presented with a pyorrhea of long standing, involving practically all the teeth. Pus was discharging profusely from nearly all the sockets. About half the process had been lost from many of the teeth and an acute condition accompanied by pain existed generally. This condition had recurred at frequent intervals for a long period. Five or six of the teeth were very loose, and the patient exhibited unmistakable evidence of a gouty diathesis—a typical constitutional case, most practitioners would say. There was considerable serumal calculus and a very evident condition of auto-intoxication of the supporting tissues.

The teeth were thoroughly scaled and all pathological tissue carefully removed by instrumentation, some of the teeth ground to relieve pressure, followed by flushing the pockets with H_2O_2 and a mild antiseptic solution; finally the teeth were polished, and the patient was instructed in the care of the mouth. The treatment occupied eight sittings at intervals of about four days in order to cover the entire ground, beginning September 21st, and the patient was dismissed on October 21st, at which time all discharge of pus had ceased, the gums were healthy in appearance, and the loose teeth comparatively tight. No pain or discomfort of any kind ensued; no constitutional treatment was administered, no change of diet or habits prescribed, and the condition of the tissues continued to improve.

About two months later the usual prophylactic treatment was given, after which the patient went to Europe. While there he indulged in rather high living, including a great deal of wine, and three months later he returned to my office for prophylactic treatment. He was suffering intensely from the effects of an excess of uric acid—to such an extent that his arm and shoulder were out of commission; they had had to be treated repeatedly while abroad. In spite, however, of this systemic condition his mouth was in

a perfectly healthy state, there being no gingival inflammation or salivary calculus present; and no care had been given the mouth other than by the patient himself. Before treatment, although without acute constitutional symptoms, he had suffered intense pain and suppuration at intervals of a few weeks.

This is what I consider a cure of pyorrhea alveolaris, and it is only one of many.

IMPROVEMENT OF CONSTITUTIONAL CONDITION NO CURE.

I do not consider pyorrhea cured when the symptoms are abated by treatment of a constitutional condition, or when the general resistance has been artificially raised—as, for instance, by bacterial inoculation. Unless thorough surgical treatment has been given, thereby removing the actual pathological condition, there will surely be a recurrent pyorrhea when the resistance becomes lowered or the systemic disease recurs. This will not be the case if the operation has been perfectly performed, the local conditions which originally caused the pyorrhea have been eliminated, and sanitary conditions maintained.

Constitutional conditions have very little to do with effecting a cure of pyorrhea, but have more to do with the establishment of immunity, and it is not immunity we are considering, but cure, which are two distinct and separate propositions.

REMOVAL OF CAUSES NECESSARY.

Pyorrhea alveolaris is the result of some irritation or injury to the tissues supporting the teeth, and while certain constitutional conditions may render the tissues practically immune to infection, and others permit or even favor the establishment of infection, so seldom are they an important factor in the treatment that they need not be taken into consideration any more than in the treatment of alveolar abscess.

The causes of pyorrhea are many, and successful treatment depends first on a thorough knowledge of the conditions governing each individual case. The cause must, of course, be removed, but what is equally important is the removal of pathological tissue resulting from the disease. This does not mean the mere removal of deposits and polishing of the teeth, as so many suppose. That is more properly to be regarded as prophylactic treatment, and if begun in time will prevent pyorrhea alveolaris unless some mechanical conditions exist which tend to injure the tissues.

CAUSES OF FAILURE IN TREATMENT.

Failure is due either to lack of knowledge or skill on the part of the operator. I have seen cases where failure to restore health was due to allowing an undue amount of pressure to exist on some tooth, so injuring the supporting tissues that suppuration was continuous. In such a case no amount of careful instrumentation alone would accomplish a cure. At other times septic teeth are allowed to remain in their sockets or are even forcibly retained by splints. This to my mind is nothing short of malpractice. Again, unsanitary crowns, bridges, and fillings make the establishment of health an impossibility.

SYSTEMATIC METHOD OF TREATMENT.

Conditions presented. Let us suppose a case of pyorrhea presents for treatment, in which a number of teeth have ill-fitting crowns or bridges. Some of the teeth are loose, and when occluded are forced out of line or into their sockets. Some of these teeth, or perhaps others, contain septic pulps. There may be large contour amalgam fillings with imperfect contact points and impinging on the soft tissues approximally. Often large masses of surplus amalgam have been forced up into the interproximal space and allowed to remain there. There will, of course, be more or less serumal calculus and a discharge of pus from many of the sockets, resulting in a considerable loss of alveolar tissue, accompanied perhaps by caries or necrosis

to a limited extent. These are some, but by no means all, of the common causes of pyorrhea alveolaris, and I have seen mouths in which the conditions were fully as bad as that just described. No mere scaling is going to restore health to such a mouth.

Extraction of hopeless teeth. The first thing to do in such a case is to determine whether or not any of these teeth are beyond hope of being restored to an aseptic and useful condition, and if not they should be removed *at once.* Here is where experience and good judgment are essential. If after extraction the socket does not show signs of proper healing, or there is evidence of necrosis or caries, curetting or perhaps burring must be resorted to and the wound properly dressed.

Removal of unsanitary crowns and bridges. Next, imperfect or unsanitary crowns and bridges must be removed.

Treatment of septic teeth. If present, septic teeth must be opened and disinfected or removed.

Correction of maloccluding teeth. Teeth suffering from malocclusion must be ground until relieved of excessive pressure both when at rest and in every motion employed in mastication, and in some cases must be ligated to give support during treatment and while the tissues are healing.

Scaling; correction of fillings. The teeth must then be scaled, and fillings properly trimmed so that nothing will irritate the soft tissues or accumulate food débris. If necessary, fillings must be removed and properly contoured, but this may be left until the mouth has been restored to health. If there are bulky accumulations of tartar accompanied by a highly congested condition of the gums, it is well to go over the entire mouth roughly at one sitting, so as to bring about at once as much improvement as possible in the superficial conditions, after which the finer scaling of the deep pockets can be accomplished at different sittings until all have been treated. Often this will not result in a perfect healing, as there remains some necrotic membrane, or in some cases a slight layer of carious tissue on the surface of the roots, or perhaps in the socket itself. All pathological tissue must be removed.

Polishing. At the last, all coronal surfaces and the cervical portions of the teeth are polished. The roots must be made as clean and smooth as those of a tooth which is to be implanted. This I do with delicate instruments not extremely sharp. The surfaces of the roots must not be scratched or marred and then filed smooth. By so doing hypersensitiveness often results. Over-instrumentation frequently results in disaster. It matters little whether the polishing of the crowns of teeth is done with rubber points and floss silk or with the orangewood stick, so long as it is thorough and the gingival margins are not injured. Brush wheels on the engine should never be used except perhaps on the occlusal surfaces.

Replacing missing teeth. When this point has been reached, the missing teeth should be replaced by whatever artificial appliances seem best adapted to the case, but they must be constructed in such a way that the patient can maintain a sanitary condition, and must not bring too much stress to bear on teeth that have lost a considerable portion of their natural support.

Post-operative prophylactic treatment. If the before-mentioned course of treatment be properly conducted, a cure will be the result. Then it depends more on the patient than on the operator to maintain health. This necessitates thorough instruction in the care of the mouth, and proper supervision by the dentist, with prophylactic treatment at intervals to be determined in each case. Such treatment is necessary because foreign decomposable matter, together with many forms of bacteria, is always present to a greater or less degree, and its frequency will depend more on the success or failure of the patient in his efforts than on any other factor. Perfect cleanliness is, however, impossible, and greater care must be exercised during a few months subsequent to the operation than will be necessary later on, when nature has had time to restore tone to the weakened tissues. In some cases this is ac-

complished with almost incredible rapidity. I have had cases which have stood from six months to two years without a single prophylactic treatment and there has been no recurrence of pyorrhea.

As stated, there is in the mouth an abundance of culture medium in the shape of food débris, and bacteria in large numbers. For this reason we must employ a method and materials which will, first, remove as perfectly as possible the accumulations, and second, inhibit bacterial growth. To produce these results the following method has proved successful in my practice: The teeth are brushed before breakfast with an antiseptic tooth-paste. After each meal the mouth is first rinsed thoroughly with any good solution, to remove loose particles of food; this is followed with a brush moistened with an antiseptic. Before retiring the gums are massaged with the paste, and as much as possible is allowed to remain over night. When it seems necessary, the patient is instructed in the use of floss silk. The proper method of using the brush is demonstrated to the patient, and it is seen to that he carries out instructions. Thorough co-operation is imperative. The brushing and massage, together with the normal use of the teeth as organs of mastication, are most important to establish and maintain normal nutrition.

AN APPARENTLY INCURABLE CASE.

The condition just described is perhaps the most common and in a way the easiest to treat successfully, but there are many phases, too numerous to mention here. One that has puzzled many dentists, and has given rise to the opinion that pyorrhea is dependent on constitutional conditions and is therefore incurable, may be illustrated by the following case from practice:

A member of our profession applied to me for treatment, having had his teeth scaled quite thoroughly, but in spite of that fact all showed a continuance of inflammation, indicating a toxic condition. Those in the upper jaw from the median line to the second bicuspid on the left side were very loose, it being possible to move them in every direction with slight pressure, even up into the sockets. (As I have said, the deposits had been removed, and there was practically no discharge of pus, but the tissues were lacking in tone.) On February 1st the loose teeth were lightly but thoroughly curetted and ground slightly to relieve pressure, and when the patient returned on February 9th these teeth were almost as firm as any in the mouth. At that sitting the rest of the teeth in the upper jaw were curetted. On February 16th all the lower teeth were treated in a similar manner, and on February 23d all were polished.

This completed the treatment, and the condition has continued to improve. The tissues have been lost sufficiently to expose the necks of all the teeth, yet the hypersensitiveness which existed before treatment has disappeared entirely.

These are not exceptional cases, but are typical of hundreds which I have treated.

Time forbids further consideration of the subject at this time, but the half has not been told.

INQUIRY BY THE LOUISIANA STATE DENTAL SOCIETY AS TO THE CURABILITY OF PYORRHEA.

In conclusion, I wish to mention that in 1908 the Louisiana State Dental Society sent a letter to twenty-nine dental societies, sixteen individuals, and seven dental journals, asking twenty-one questions about pyorrhea alveolaris. Six societies and nine individuals answered these questions, and the report was made at the meeting held on April 29, 1909, and printed in pamphlet form. The report is too long to embody any considerable part of it in this paper, but I will state the first two questions, as having a direct bearing on the subject now under discussion.

The first was—"Do you consider pyorrhea alveolaris incurable?" Twelve out of the fifteen answers, including the author's, was "No." The second question—"Do you know of any cases that have been cured?"—was answered by the twelve with "Yes," two stating "Hundreds." These answers are significant of

what is being accomplished all over this country in the successful treatment of pyorrhea alveolaris.

There are many points in connection with the subject that it has been impossible for me to mention, some of which may be brought out in the discussion. I have tried to show what I consider a cure of pyorrhea alveolaris, and in a general way, how it may be accomplished.

"PRACTICE MAKES PERFECT."

If any practitioner fails in his attempts, he must not conclude that a cure cannot be effected. If he fails there is a good reason for it, and he may succeed later on. The treatment is not obscure or mysterious; it is a simple surgical proposition, but, like any delicate surgical operation presenting many sides, it cannot be mastered in a short time or with little effort or thought. The busy general practitioner, whose time is filled with the consideration and execution of many other things, cannot hope to succeed in the treatment of difficult cases. If a man possesses the inherent ability, with the proper experience and practice, he will acquire the necessary knowledge and technique, as has already been proved by many throughout the land.

Discussion.

Dr. A. C. RICH, Saratoga Springs. The essayist has so thoroughly covered the ground from the standpoint of one who believes that pyorrhea is curable that he has left little for me to say. "What Constitutes a Cure of Pyorrhea Alveolaris, and How May It be Accomplished?" is the title and text to which the essayist has addressed himself. "What constitutes a *cure?*" What does that mean—a permanent cure, or simply a return of the parts to normal conditions less the destruction already accomplished by the disease? One cannot assume from superficial conditions that a permanent cure has been effected; time alone can demonstrate the truth or falsity of such an assumption. Typhoid fever has been known to occur a second and even a third time in the same person, yet it was supposedly cured each time. That was a constitutional disease, while pyorrhea is simply a local manifestation of the disturbance of normal conditions of the parts involved. Remove the causes—which may be many, and may be any results of a toxic condition—and the normal condition may be restored. No cure can be expected until the causes have been eliminated. The operator must study the cases and get at the why and wherefore.

I believe it to be well-nigh impossible that each and every member of the profession shall be equally successful in all things. I am of the opinion that there is a certain tactile sense in the fingers' ends which is a requisite to successfully fight pyorrhea alveolaris. Let me call your attention to a portion of the essayist's quotation from Dr. Geo. S. Allan's paper. He holds that it is a crime for a dentist to offer ignorance where knowledge is expected, and thereby mislead a patient as to his chances and opportunities of a cure. Are we as a profession hoodwinking ourselves? Shall we not place ourselves on a plane with the medical and other professions, and recognize individual merit and skill in specific lines of work in our profession, and thereby better protect the people against loss of teeth through the assumption of knowledge and an over-readiness to deny the existence of something because we cannot prove that it is truth. Why shall we allow certain prominently known and accredited members of our profession to dominate the opinion or substitute their opinions for those of the profession on this subject of a cure of pyorrhea alveolaris, because *they* have not been able to effect a cure? And they go on elaborating their failure through essays or articles in magazines, seemingly trying to blindfold or hoodwink the profession generally, denying to anyone the possibility of a cure, even when confronted with a perfect one, and saying with cold comfort, "Oh, yes, that is very nice, but the trouble will return." This is but the same old contention of theory *versus* facts, or truth. The truth is bound to

win in the end, but in the meantime the poor patients have to suffer and lose their teeth. An ounce of fact is worth pounds of theory. In this age of progress it is folly for any man to set himself up as the great and only "Pooh Bah," and issue an edict that such and such things cannot be because he has not seen them, or that such and such things cannot be done because he has not seen them accomplished or cannot accomplish them. Such men are more than a hindrance to progress; they place a stigma on the profession which they assume to honor.

What constitutes a *cure* is of itself a desirable thing to know, yet the greater thing is how to perpetuate that condition. As professional men, and as teachers of the people regarding the care of the teeth, we are not at present fulfilling our duty; we do not take time to properly instruct or demonstrate prophylactic care of the teeth and mouth. How many in this room ever asked a patient to bring with him a tooth-brush and demonstrate how he used the brush in his mouth. If you ask the question, "Do you use your tooth-brush regularly?" you will usually get the reply "Yes," but do not the patients brush their teeth as the small boy may black his shoes, polishing them nicely on the toe and front but leaving the heel untouched? I hope the day is not far distant when conditions in our profession will allow of consultations more generally, when members of our profession who specialize in this work will be available for consultation as well as for services in specially difficult cases. Much good may come therefrom, and great benefit to the people at large in the saving of their teeth and correspondingly their health also. Let the good work go on!

Dr. A. R. Cooke, Syracuse. Pyorrhea alveolaris comes up at every dental meeting as one of the principal subjects for discussion. We have heard this same story gone over for the past twenty-five years. It is a discussion arising over the question of constitutional or local causes.

The paper of Dr. Hutchinson has covered the ground very thoroughly from the standpoint of one who believes in the strictly local cause of pyorrhea alveolaris. He has demonstrated—and we probably all agree with him in that demonstration—that pyorrhea alveolaris, as it is commonly accepted, is curable by local instrumental treatment. A large percentage of cases that we are willing to grant as curable should have been prevented by the same method of treatment which we are adopting to cure them. If the patients whom we are treating for the removal of serumal calculus, and the restoration to a normal healthy condition of the gum tissue, had been properly taken care of by their dentists from the time when they were six years old, we should have very few cases of pyorrhea. If we do have them, we shall not cure them by local treatment. If we cannot prevent them by local treatment we cannot cure them by local treatment.

As dentists we are not considering the health of the gingival tissue to the extent of treating all conditions of congestion or gingivitis from which we get a hemorrhage in the removal of calculus or otherwise. If we were, and would follow this up—keeping the gingival tissue healthy until our patients reach adult life—the discussion of pyorrhea would be limited.

This question was under discussion at a recent meeting at Rochester. A noted specialist, after having gone over the ground, was asked by one of the members present if he, the essayist, could have cured a certain case of pyorrhea. The case in question was one in which there was no calculus, either salivary or serumal. The tooth had merely dropped out, or exfoliated, as one might say. The reply of this noted specialist was: "Gentlemen, this is not a case of pyorrhea alveolaris." Now, that was what I should have called a case of pyorrhea alveolaris. The cases that I can cure, that Dr. Hutchinson cures, and that any gentleman in this room can cure if he is persistent, should never be called pyorrhea alveolaris. Let us call them dental neglect, or any neglect you wish; they are simply due to neglect on someone's part.

We have in the United States and Canada thirty thousand practicing dentists. Of this number, at least twenty-nine thousand never give any systematic care to the health of the smaller portions of the gum tissue. We cannot hope to conquer this disease by the establishment of a specialty. I do not want to dignify this work too much under the name of prophylaxis. Prophylaxis is a nice long word—it sounds better than some of our old terms for this treatment; perhaps we can get a better fee for it. It may impress the patient; but by all means let us get at the bottom of the matter. A dentist may feel like a scrubwoman before he gets his *clientèle* cleaned up, but it will pay him in satisfaction if not in dollars.

Dr A. L. Swift, New York. I think many cases of so-called pyorrhea which are cured—I am not referring to those mentioned by the essayist—are not cases of pyorrhea at all. If in speaking of pyorrhea alveolaris we would confine ourselves to the definition which I believe is the accepted one, *i.e.* that it is an inflammation of the supporting tissues, or the pericemental membrane surrounding the teeth, with a flow of pus from the alveolar socket, we should understand each other better. I do not consider true pyorrhea alveolaris to be expressed by any other definition. With reference to such a condition, I think the essayist's definition of a cure is one on which we might debate for some time. If he means the stoppage of this flow of pus, and the apparent return of the tissues to a normal condition, ignoring the question of immunity or recurrence, I have cured hundreds of cases of pyorrhea; but I have never told a patient that I could cure absolutely an advanced case of pyorrhea, and by that I do not refer to the cases which we might consider of local origin—to hark back to the same question of etiology, the question as to whether pyorrhea is of local or constitutional origin. Cases of ill-fitting crowns or bridges, of malocclusion—and, by the way, malocclusion is the most important factor I know of—fillings protruding into the gingival space, improper approximal contact, I look upon as local cases, and I believe that, if the disease has not progressed too far, some results can be obtained; but there are some forms of the disease in which we can in no wise deny its constitutional nature, it being in my opinion a local manifestation of a constitutional condition. This is simply a reiteration of what has been said many times; but it is necessary to place oneself in the minds of one's hearers as to his stand on this subject.

I have heard Dr. Hutchinson say that pyorrhea is a disease of filth, and that it is absolutely always of local origin. I have observed cases of what Professor Black terms the phagedenic variety, the clinical feature of which was the absence of calcareous deposit; and yet that is the most rapid form of pyorrhea, and by far the most difficult type to combat. That I believe to be a local manifestation of some constitutional condition. I do not go so far as to state what condition I think to be at the bottom of it, but faulty metabolism is a good term and covers a multitude of sins, as has been said earlier in the afternoon.

I find that in the cases which have advanced to any great extent the effecting of a cure requires all one's pains, time, and skill. Sometimes there is no malocclusion; I have several cases in mind which I am treating, where the teeth are all present and the occlusion is as nearly normal as I have ever seen it, and yet these patients present the phagedenic variety of the disease in the upper and lower canines. No other teeth are affected. The gums have remained intact at the gingival margin, exhibiting only a slight redness; yet pus will exude upon pressure over the tooth on the gum. Such teeth must be held firmly by some sort of splint and be given surgical rest as nearly as possible. I find nothing so efficacious in those cases as Head's bifluorid of ammonium, with which I obtain the best results, after proper instrumentation, and I do not consider its manipulation dangerous at all if proper care be applied. I made the same statement one year ago, when Dr. Hofheinz spoke of his experience with it. I am

using it daily. I used it before it was on the market—Dr. Head sent me a bottle—and I have never had a bad burn. I do not have the same difficulty as was mentioned in the discussion of Dr. Merritt's paper, of the patient complaining of a great deal of pain after the application. I never use much force on the syringe in treating large pockets—just enough to carry the liquid into position. This is particularly essential in pockets in the upper arch of difficult access. In small inaccessible pockets I use no syringe at all, but fine wooden points, which I trim with a penknife to fit these pockets, and on which I carry the bifluorid of ammonium into the pockets. I have never had any complaint of pain for more than half a minute.

I believe that the sooner incurable teeth are extracted, the better. The restoration of proper occlusion is, of course, most essential in all cases. This and the restoration of the extracted teeth are first to be considered in order to keep the arch in its normal position, and maintain correct articulation.

I wanted to commend another point which Dr. Hutchinson mentioned—viz, that when the mouth is in a bad condition it is best to apply a general superficial treatment at the first sitting. I always do that. When I undertake a case of pyorrhea which is at all advanced I never confine my attention to one, two, or three teeth at the first sitting. I go over the mouth, taking about one hour and a half, and as a preliminary remove as much deposit as I can. Then I use Head's bifluorid of ammonium. I am not firm in the belief that bifluorid of ammonium is a tartar solvent, but it has a wonderful effect on the tissues. I am surprised that Dr. Hutchinson has failed to mention its use. Evidently he depends entirely on asepsis and instrumentation. Anyone who has given Head's bifluorid of ammonium, or even a 5 per cent. or 6 per cent. solution of trichloracetic acid, a fair trial will find that either has a most marvelous effect in the toning-up of the inflamed tissues. When the patient comes back the second time, almost all the rough tartar that it is possible to reach can be removed, whereupon I undertake a systematic campaign to get out all the tartar from all the pockets. Someone spoke today about the danger of using bifluorid of ammonium in small pockets, but I obtain the best results in just such pockets.

Still referring to local conditions exclusively, we notice some mouths in which even the simplest surgical wound will not heal—in diabetic patients, for instance. I think it would be worse than useless to attempt to treat a case of pyorrhea in the mouth of a diabetic or other patient who is in such low physical state that a simple surgical wound will not heal. It is the dentist's duty to send such a patient to a physician for treatment, not only from regard for the condition of that patient, but to secure the possibility of results in his mouth. I should feel that my time was wasted in such a case without the aid of the family physician in regard to constitutional treatment. After the constitutional condition has been improved it is surprising how different are the results.

I do not know of any subject, except general oral prophylaxis, in which I am more interested, or upon which I have spent more time for the past twenty years, than the treatment of pyorrhea. I see a number of cases every day, and the only difference between the results I obtain and the results claimed by some of my friends is that they claim more than I do. I honestly believe that I obtain just the same results, but I do not make the broadcast claim that I absolutely cure pyorrhea alveolaris, because I believe that unless the patients co-operate conscientiously, and thoroughly carry out all instructions as to the care of their mouth—and more than that, unless they return regularly for subsequent treatment—pyorrhea cannot be cured absolutely. I would not think of treating an advanced case for weeks and weeks—I do not believe I should get the same attachment. In my opinion, if the condition has occurred once it can occur again, and I would never say to a patient, "You are cured, and the disease can never recur." I insist upon the

patients' returning for treatment, so that I may see that there is no subsequent calcareous deposit. The patients must be kept under constant care if results are to be gained.

President Nash. A few more discussions of this kind will so clear the atmosphere that we shall soon know what kind of pyorrhea we are discussing, and how it can be cured. I think Dr. Swift and I have come more closely together in the discussion which I have just heard than ever before, although personally I have expressed some of the same ideas.

Dr. M. L. Rhein, New York. This subject may be old, coming up year after year, as Dr. Cooke said in his excellent remarks; but it is of paramount importance that, under the present condition of the general profession, it should persistently come up in this way. I was delighted personally with the discussion of Dr. Cooke; there was not a word that he and Dr. Swift said on this subject to which I could not give my most hearty assent.

This is a subject of vital importance, but I think the manner in which it has been presented to us today is extremely misleading. There has been a great deal said—a great deal of fault found with certain men, and much derision of those who doubt the possibility of what they choose to call pyorrhea being curable. From my standpoint this is a bugaboo of recent discovery that is entirely irrelevant; it has no bearing on the case, whether Dr. Jones tells his patient that his condition is curable or incurable. A patient presents himself with a pathological condition in the mouth. The question that presents itself to the intelligent dentist, stomatologist, physician, or anything you choose to call him, is this: Shall the patient go on in life with his mouth and teeth in an unhealthy condition? Shall the diseased teeth be removed, or shall all reasonable efforts be made to place the mouth in an aseptic condition, and the endeavor be made to teach the patient to keep it so? That is the real condition that confronts the profession in regard to their duty to the patient. It is quackery for them to tell a patient that they can cure a disease; that is the way of a quack or a charlatan from all time back, and I deplore the introduction of anything pertaining to charlatanism into our profession. That is the reason why I feel displeased with the bringing-up of the question of such conditions being incurable, to the detriment to the public.

What do you mean by pyorrhea? I have investigated a great many conditions of so-called cure of pyorrhea. I have seen patients who have been cured, after having been told that they had pyorrhea. Thousands of patients have consulted me as to whether their pyorrhea was incurable, in whose mouths it was impossible for me to see any trace of a pyorrheal condition. Personally, I believe the condition of pyorrhea alveolaris to be a very rare one. It is not by any means as frequent as we are led to believe. It is to be deplored that men should aggravate the nature of any trouble, or make it appear to be more severe than it is, in the minds of their patients.

There are cases of pyorrhea alveolaris, and I use the word advisedly, that are as incurable as the disease from which a patient lies dying on his bed. Consequently, if I am correct in making that statement, this dogma that was first started by Dr. Patterson and then advocated by my friend the essayist, is inadvisable. The essayist will probably agree with me on this question, if he stops to think. Dr. Patterson, whom he quoted, at Birmingham made this same sort of remarks—after what? After a paper that was one of the best I ever listened to, presented by Prof. E. C. Kirk of the University of Pennsylvania, in which he recited the consequences of surgical interference in such cases as these, where the patient was suffering from diabetes, and where such interference resulted in the untimely death of the patient, unquestionably from surgical interference at a time when every physician realizes that it means possibly the immediate death of the patient. Yet Dr. Patterson had the temerity on that occasion to rise and deride the essayist's statements.

Unfortunately for the essayist's position in this matter, he controverts himself. In his paper today, as on former occasions, he has admitted the fact of recurrence—but more today than I ever heard him admit it before, and I congratulate him upon that progressive step—as I understood him, even after constitutional treatment brings about immunity (it being an idle quibble to stop and differentiate between the way in which the essayist puts it, or as to the value of immunity). If we are to practice intelligently, we must know understandingly what are the conditions we are treating. If we are treating filthy mouths we are not treating pyorrhea alveolaris. If we are treating gingivitis we are not treating pyorrhea alveolaris. There is tubercular pyorrhea and pyorrhea due to heart disease; and since the essayist described that condition, I want to describe a case that came under my observation last Saturday.

On Friday I had a telephone call from a young woman who said that she had been trying to have her mouth treated for pyorrhea, and she had been sent from pillar to post, and had been finally recommended to see me. I gave her an appointment for Saturday. When she arrived I was very busy—so busy that I felt I would have to ask her to call again. I went into the waiting-room and found a young woman of twenty-six, whom I did not want to dismiss summarily. I asked her to let me look at her mouth casually, over by the window. I found it to be a case of acute pyorrhea alveolaris, pus flowing freely from every socket in the mouth—as marked a case as I have ever seen. I quickly recognized the predisposing cause of that pyorrhea to be heart disease. There was an impairment of the heart to such an extent that the entire mucous membrane of the mouth was cyanosed—and anyone who has examined heart disease recognizes that disease at once. It was interesting to me to demonstrate to a physician, whose wife I was treating at that moment, the value of mouth examination in diagnosis; so I asked the young woman to be seated, returned to my office, and recited the facts to this doctor, asking him if he were willing to examine the patient's heart. He made an examination with his stethoscope and at once corroborated the diagnosis of her condition.

He sent me a letter going over the facts in the case, because I had him make an appointment with the young woman to examine her carefully. Upon this examination of her heart, he told me that he did not think it to be an organic lesion. Neither did I. A careful examination of the patient, who is a bookkeeper, showed that the heart disease had been caused by the most common constitutional exciting cause that I believe we find in large cities today, *i.e.* intestinal auto-intoxication. The woman gave a history of having a movement of the intestines sometimes not more than once in six or seven days; and I have no doubt that this auto-intoxication has affected the muscles of the heart, as was borne out by the examination. The history of the patient shows the development of the pyorrhea as a result not directly of the auto-intoxication, but of the impaired nutrition due to the fact of the heart being unable to perform its functions properly. I am reciting this case solely for one purpose: I would have liked to read in detail the result of the examination of this patient, because it is a typical one of a rare type. My object, however, is to bring out the fact that if we are to be intelligent practitioners, it is ridiculous for us to say, "Here is a case of pyorrhea," and nothing more. Each case of pathologic disturbance of the mouth should be diagnosed and treated on its own merits, and the diagnosis should be made conclusive before intelligent treatment can be pursued. This is the important step that we must learn as dentists, if we want to receive the respect of any intelligent physician.

I agree with the essayist in everything he has said about the treatment of this class of cases, as far as local treatment is concerned. There is no difference of opinion on this subject, and there is no need of discussing the local treatment. I would emphasize every point he emphasizes, and in regard to cases which

present without any recurrence of the trouble, I can cite the history of many similar ones. Prophylaxis does not depend for its real value on the visit to the operator; it depends on the intelligent care of the mouth by the patient. If the patient does not give the most thorough care to those details that are important, his visits to the prophylactic operator are well-nigh valueless, and that is the history of many cases. The majority of cases can be cured if there is no organic incurable condition present, and if the patient will carry out instructions—for in that is revealed the secret of real prophylaxis. The patient that the essayist referred to evidently learned this lesson of carrying out his instructions as to the care of the mouth. The result was that the indiscretions that impaired the circulatory system affected other portions of the end-organs of the body; but evidently he kept toned up the capillary circulation around the roots of the teeth, and they did not suffer as formerly. This is no uncommon result, and is the one logical inference that we may draw. It speaks well for the instructions which the essayist gave to his patient.

I agree most emphatically with the essayist with regard to the important rôle played by malocclusion, also as to septic conditions in pulpless teeth, and as to the other conditions spoken of; but the vital point of treating such conditions is this: Can they be treated properly by a person placed in the position that the essayist places himself in, unless the patient is turned over unreservedly to him? I say No—most emphatically, No. The plan which the essayist has adopted, of trying to treat the oral symptoms, the local conditions—having the mouth placed in a healthy condition as far as the local conditions are concerned, and then referring the patient back to the dentist—is bad treatment, because the result will be successful only in a limited number of cases. Success will be obtained only if the practitioner who has referred the patient to the essayist and to whom the latter refers the patient back, is competent to do the work satisfactorily—and he is not so in the majority of cases in which the patient is referred to a specialist, for if he were capable of administering treatment himself, the practitioner would not refer his patient to the specialist.

That is the weak point in the method pursued by the essayist. If he would specialize in the treatment of pyorrhea on the lines he does, and say, "You must send these patients to me, and they must become my patients, and I will give them proper treatment," I would give him my entire support in his work, but by his method this work is impossible. I have found myself in that position over and over again. I have said to colleagues, "I cannot treat your case unless you give up the patient, this being the only way in which a case of this kind can be conscientiously and intelligently treated."

Dr. Hutchinson (closing the discussion). I am going to begin from the end, and go backward.

Dr. Rhein has discussed the subject so fully that it is impossible for me to answer him in the time at my disposal. I am surprised, however, that Dr. Rhein should know so much more about my practice than I do myself. I was under the impression that I am successful, but Dr. Rhein maintains that I am not. I said nothing about specialization, as it is entirely foreign to my subject; but my conclusions have been reached by the successful results that I have accomplished. At any rate I shall adhere to my method of treatment. I have cured pyorrheal conditions in diabetic patients, who passed forty-eight ounces of urine over night, and showed more than ten per cent. sugar; this surely was pyorrhea such as Dr. Rhein would have acknowledged.

The cases that are presented to me I do not mechanically house-clean. Pyorrhea patients are referred to me by practitioners of high repute and knowledge, and I confirm their diagnosis, and defy anyone to contradict it. I am not discussing what is or what is not pyorrhea alveolaris. It is the culminating condition which follows a series of conditions. The culmination is no more like the incipient condition than black is like

white; but in its incipience as well as in its culmination, prevention is the proper treatment. Prophylaxis has been spoken of as a term by the use of which we might obtain more remuneration for our work. That is all nonsense. The definition of "prophylaxis" is prevention—warding off of disease; and that is what prophylaxis will accomplish—prevention of the initial pyorrhea, and also prevention of a recurrent pyorrhea when it has been cured; if pyorrhea be not cured it is because not all the pathological conditions have been removed.

There are, of course, cases in which there is no calcareous deposit. Sometimes there are large deposits, but more frequently there are not any. In mouths that have been neglected deposits are found. It is not the mechanical removal of these calcareous deposits that cures pyorrhea, but the removal of pathological tissue—the delicate, surgical removal.

If any practitioners wish to call themselves mechanics, very well; I do not—I call myself a dental surgeon. My diploma states that I *was* one when I was graduated; I was not, but I have since become one. I remove tissues which have become toxic, and in many instances the intestinal auto-intoxication has been brought about by the pyorrhea which has existed long before the intestinal auto-intoxication began. The swallowing and absorbing of toxic matter into the blood channels and the intestines account for all sorts of disturbances in the system. The toxins are eliminated through the kidneys, and an overloading of the kidneys will result in their breaking down, which is followed, as you all know, by a long series of untoward symptoms.

It seems futile to discuss this subject at great length, and my only apology for coming before you is the fact that perhaps inadvertently many practitioners have created a false impression and have led the profession to believe that it is useless to treat pyorrhea. Many patients have told me just what Dr. Allan and Dr. Patterson have said—and what I quoted was not taken from Dr. Patterson's discussion of Dr. Kirk's paper. Whether this disease is pyorrhea alveolaris, or something else, I care not; it is a condition which the profession generally calls by that term—although I think it a very inadequate term—and which results in disaster locally and constitutionally. The people cannot secure adequate relief from this trouble as long as the profession considers that it is useless to try to cure it.

Famous practitioners have sent cases to me for treatment, saying: "I do not believe that this case is curable, but it is worth while trying to treat it." I do not claim that I am the only one who is successful in his treatment, by any means; but I am relating facts from my own experience.

In regard to diagnosis, I most thoroughly agree with Dr. Rhein. It is absolutely essential that when a case presents for consideration it should be studied. Ample time should be devoted to a critical and thorough examination of the mouth, the conditions should be charted, and each taken into full consideration. If one little item be overlooked failure will result, just the same as if one ingredient is left out in a prescription for a chemical compound.

Dr. Rhein. How do you correct those deviations from the normal?

Dr. Hutchinson. I think there are gentlemen in the profession who are thoroughly competent to perform their part of the work, such as restorations of lost teeth, fillings, etc.

Dr. Rhein. Always?

Dr. Hutchinson. No, not always.

Dr. Rhein. I think that is very germane to the subject. If it be necessary that these measures be taken, the question is, How do you get them taken?

Dr. Hutchinson. By co-operation with the dentist. A great deal of good will result in this way. It is the best kind of spur to careless men, to make them do their work well, or they will lose their patients. We must do something to whip some men into line.

Dr. Hofheinz. Is it not a fact that men who refer to you cases of pyorrhea due to malocclusion, and do not treat them, are not fit to treat them?

Dr. Hutchinson. The cases I speak of are cases generally well advanced. I have treated them at all ages, up to ninety-one years. They are not generally such as can be corrected by the orthodontist.

Dr. Hofheinz. Where the first molar has been extracted?

Dr. Hutchinson. The cases of acute pyorrhea brought about by malocclusion are mainly due to excessive pressure. In such cases I change the occlusal planes. If there are restorations to be made, I consult with the practitioner who sent the case to me in regard to the best means of restoring the missing teeth. I believe that I am doing a favor to the dental profession, and the public in general, by consulting with that practitioner; it helps his patients and is educational work.

It is impossible, as Dr. Rhein knows, for any one man to master all forms of treatment; Dr. Rhein does not do that himself. He leaves out the most important part, *i. e.* instrumentation—that his assistant does. This may be foreign to the subject, as the subject of specialization was not mentioned in the paper. I believe that a man by devoting himself to one specialty can accomplish what cannot be accomplished in any other way.

Head's bifluorid of ammonium has been mentioned. I have used Head's solvent once or twice, and have seen the results of its use in the hands of good practitioners many times—and very disastrous results they were. If you will permit me, I would like to state also that cases are referred to me not by men who are incompetent to do good work, as has been suggested by someone; for I could astonish you with the names of some of the men who refer cases. I have treated cases in which Head's solvent has been used by such men, and used carefully, and I have had a case which had been operated on by Dr. Head himself with a disastrous result. These cases appertain to the lower jaw. One presented a pocket on the distal surface of the posterior root of a lower molar. There was a considerable discharge of pus. Head's solvent had been injected, considerable pain ensuing. The operator said that he had washed out all the solvent, yet the pain continued. The patient then insisted on having me treat her, having been my patient before, and the dentist wrote me about the case. The pocket extended twice as far down as he had supposed. It was an attenuated pocket extending deeply down, and the solvent had gravitated down there and had not been removed. Subsequently the extirpation of an otherwise healthy pulp became necessary—proving how carefully Head's solvent must be used.

Dr. Swift. Did that dentist not use some force in carrying the medicament down?

Dr. Hutchinson. I do not know. I do not use the tartar solvent, because I have not had a case in over a year that called for such treatment; the instrumentation alone suffices. I do not think I shall ever use it again; I am afraid of it.

Dr. Swift. I would like to show you how it can be used without doing any harm.

Dr. Hutchinson. But what would be the use, if I obtain results without it?

Dr. Rhein. The essayist has cited my own method. It is true that I have certain work done by different men; but it is all done under the direction of one overseer. Would it not be feasible for the essayist to conduct the treatment of these cases in this way, by having men associated with him who could successfully carry out his ideas? The essayist himself has expressed on one or more occasions his disapproval as to the way in which his instructions were carried out by other practitioners. He surely would obtain much better results for the patients by the method suggested and bring about really ethical relations between the dentist and the public.

Dr. Hutchinson. I have often thought it might be as Dr. Rhein suggests. In quite a number of instances the work which I do not undertake personally is not carried out to my satisfaction; but I believe that I can render the greatest service to humanity by conducting my practice as I do. Many mem-

bers of the profession feel free to send cases for the form of treatment which I administer, and they would not do so if I gave general treatment in my office; so that I believe I am doing most good to the greatest number by the present way of conducting my practice.

The society then adjourned until 8 P.M.

FIRST DAY—*Evening Session.*

The meeting was called to order by the president, Dr. Nash, at 8.30 P.M.

The Secretary read the minutes of the afternoon session, which were approved.

Dr. H. J. BURKHART announced the program for the session.

Dr. HILLYER offered the following amendment to the by-laws, and moved that it be acted upon at this time:

SECTION 12A. No one shall be eligible to membership in a district society who shall be in arrears for dues in another district society.

Dr. H. J. BURKHART stated that according to the by-laws the proposed amendment would have to lie over until the next session. It was so ordered.

Dr. W. B. DUNNING then read the report of the Committee on Scientific Research, as follows:

REPORT OF COMMITTEE ON SCIENTIFIC RESEARCH.

Mr. President and gentlemen,—Owing to circumstances which were beyond the control of your committee a definite plan of work was not concluded until late in the season. Further difficulties were met in making suitable arrangements for the laboratory work involved, and it is to be regretted that the actual time for experimental work has been quite limited.

The present purpose has been to follow out the suggestions made by Dr. Waugh in his report last year, in which he suggested that a further study be made of the bacterial plaque in relation to the carious process, and of the influence of mucin and of potassium sulfocyanate upon plaque formation.

The work was placed in the hands of William J. Gies, M.S., Ph.D., professor of biological chemistry, College of Physicians and Surgeons, and the actual experimentation was performed under his supervision by Dr. Emily C. Seaman, instructor in biological chemistry, Teachers' College. The committee feel themselves much indebted to Dr. Gies and to Dr. Seaman for the accurate, painstaking, thorough, and yet expeditious manner in which, in very limited time, they have carried through an elaborate series of tests and check tests, in order that some definite findings might be presented at this meeting. With a view to accuracy and dispatch Dr. Gies' report is given *literatim* as follows:

COLUMBIA UNIVERSITY,
DEP'T OF BIOLOGICAL CHEMISTRY,
April 30, 1910.

DR. W. B. DUNNING, Chairman of the Committee on Scientific Research.

Dear Sir,—We have the honor to report some results of the investigation on dental caries which, at your request six weeks ago, we agreed to conduct under the auspices of your committee. Our work, as suggested by you, has been carried forward directly along the lines of desirable further progress that were specified in your committee's report last year.* We have also repeated some of the experiments referred to in that particular report.

GENERAL PLAN.

The future work that was suggested by your committee in its report a year ago is indicated briefly by the appended summary:

First: Repetition of the experiments on the influence of potassium sulfocyanate "in retarding plaque formation."

Second: Further study of the dental microbic plaque after the improved technique described in the said report, and with special reference to the following points:

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* "Investigations on Plaque Formation and Dental Caries in Relation to Saliva." Being the Report of the Committee on Scientific Research, Dental Society of the State of New York (May 1909), L. M. Waugh, Chairman. (DENTAL COSMOS, 1910, vol. lii, p. 170.)

(*a*) Nature of plaques that probably would be formed on strips of glass immersed in the inoculated culture medium;

(*b*) Possible formation of plaques on natural extracted teeth suspended in the inoculated culture medium; and

(*c*) Possible decalcification of natural extracted teeth immersed in the inoculated culture medium, particularly in the presence of carbohydrate.

Third: Studies of the possible influence of mucin and glutin (gelatin) as predisposing factors in dental caries (plaque formation).

General Conclusions.

Although we have had less than a month in which to conduct the actual work before us, our results along the foregoing lines, so far as we could follow them to the end, warrant the following general conclusions:

(1) Potassium sulfocyanate, in proportions in the culture media equal to as much as from four to fifteen times those in normal saliva, did not prevent prompt growth and multiplication of bacteria obtained from carious teeth and from normal saliva. Plaque formation was not inhibited to any noticeable degree.

(2) The predicted plaque formation was obtained on glass strips immersed in the prescribed inoculated culture medium. The method promises to yield material that can be studied in detail with regard to both its bacterial and its chemical qualities.

(3) *Adherent* plaque formation has not occurred on natural extracted teeth in the time that elapsed since their original immersion in the inoculated culture media. Further study of this possibility is necessary.

(4) Natural extracted teeth, immersed in the inoculated culture medium, are apparently decalcified slightly in a few days, especially in the presence of potassium sulfocyanate or glucose. These experiments should be repeated and extended, since our few preliminary positive results may be mere coincidences. The bacteria from carious teeth were found to be acid-producing, a fact that would explain the decalcification noted.

(5) Salivary mucin solutions of several kinds were found to provide nourishment for bacteria from carious teeth. Our preliminary results with mucin encourage the belief that this particular line of work will afford fruitful results.

Experimental Data.

We append hereto the details of our work in the order in which they are recorded for the most part in Miss Seaman's laboratory note-book.

PREPARATION OF THE CULTURE MEDIUM.

The preliminary work was begun on the 24th of March 1910. There was some delay in obtaining a very young lamb for use in the preparation of the special culture medium, as none of the slaughter-houses in the city handled animals so young. A lamb about ten days old was obtained early in April from a man in New Jersey, who personally delivered the animal to us at the Columbia Medical School. The lamb was bled to death under light ether anesthesia. Enough meat was obtained from the carcase to make two liters of broth. The culture medium was prepared in the following manner, in general accordance with the method already described by the Dental Research Committee (*loc. cit.*, p. 174):

After removing the small amount of adherent fat from the flesh, the lean meat was divided into two portions of exactly 500 grams each. Each portion was separately bruised with a mallet and kneaded in a liter of distilled water which had been previously saturated with calcium carbonate. The milky liquid was then strained through sterilized cheese-cloth, the volume made up to exactly one liter, and placed in 500 ccm. flasks. The medium was heated for thirty minutes in an Arnold sterilizer, shaken to break up the resultant coagulum, and heated again for fifteen minutes. It was then filtered and most of it immediately tubed. The total remainder was placed in four 25 ccm. flasks. All of the medium was sterilized for thirty minutes on three successive days in the Arnold sterilizer, beginning with the day it was tubed. The broth made a clear, colorless, slightly opalescent liquid, which proved to be a remarkably successful medium in which to grow salivary bacteria.

EXPERIMENTS.

General procedure. Carious teeth were obtained from Dr. James F. Hasbrouck. The carious parts of several such teeth were scraped out and the scrapings mixed with saliva obtained from a janitress whose teeth were in a neglected condition. About 5 ccm. of the mixture was poured into each of three 25 ccm. flasks of broth. These mixtures were incubated, and, at the end of twenty-four hours, transplants were made on agar slants and these incubated. The next day the agar slants all showed heavy white growths. The above-mentioned flasks of inoculated culture medium were used for inoculations of the

tubed culture medium employed, in 10 ccm. volumes, in the experiments described below.

I. *The influence of potassium sulfocyanate on bacterial growth and plaque formation.*

A 0.06 per cent. solution of potassium sulfocyanate was prepared. Into each of ten tubes were poured 9 ccm. of the inoculated broth and 1 ccm. of the KCNS solution—a total volume of 10 ccm. The amount of KCNS in the mixture was therefore 0.006 per cent. A long narrow strip of glass was placed in each tube for the purpose of studying plaque formation, if any occurred. The tubes were then incubated. At the end of twenty-four hours there was heavy white growth in each tube. The scum-like mass extended over the top of the medium, also some distance up the sides of the glass strips and on the sides of the tubes. Adherent gelatinous plaques were seen in the growth.

Further studies were made in this connection. Five tubes were similarly prepared, but twice the amount of KCNS was added, *i.e.* 2 ccm. of 0.06 per cent. KCNS solution in a total volume of 10 ccm. (0.012 per cent. KCNS). After twenty-four hours' incubation, adherent gelatinous plaques occurred on all the glass plates.

Another set was made, with increased amounts of KCNS. Of these, three tubes had 4 ccm. of 0.06 per cent. KCNS solution in a total of 10 ccm. (0.024 per cent. KCNS), in two of which glass plates were placed; in the third a natural extracted tooth was suspended. One extra tube contained 8 ccm. of 0.06 per cent. KCNS solution in a total of 10 ccm. (0.048 per cent. KCNS). A tooth was also suspended in this mixture. After twenty-four hours' incubation, growths occurred in all tubes and on the plates and tooth, although in the tube containing 8 ccm. of KCNS solution with only 2 ccm. of culture medium, less growth occurred than in the others.

The results of these experiments show that potassium sulfocyanate, in amounts greater than those that occur in saliva, has no marked inhibitory influence on the growth of salivary bacteria and fails to prevent plaque formation.

II. *The influence of oil of cassia and carbolic acid on bacterial growth and plaque formation.*

(1) *Oil of cassia.* An emulsion was made of oil of cassia in culture medium. Five tubes of inoculated broth and emulsion were arranged in the following proportions: 9 ccm. of broth and 1 ccm. of emulsion; 8.5 ccm. of broth and 1.5 ccm. of emulsion; 8 ccm. of broth and 2 ccm. of emulsion; 7.5 ccm. of broth and 2.5 ccm. of emulsion; 7 ccm. of broth and 3 ccm. of emulsion. Glass strips were inserted. The tubes were incubated, and no growth occurred in any. The oil of cassia, in the proportions employed, completely inhibited plaque formation.

(2) *Carbolic acid.* A 0.5 per cent. solution of carbolic acid was prepared. Inoculated broth and this carbolic acid solution were arranged in five tubes in the same proportions as those in the set with the oil of cassia. Glass strips were inserted. The tubes were incubated, and no plaques formed in any tube. Carbolic acid, in the proportions employed, inhibited plaque formation in each case.

III. *The influence of oil of cassia and carbolic acid on bacterial growth and plaque formation in the presence of potassium sulfocyanate.*

Another comparative set of ten tubes of inoculated culture medium was arranged in which 1 ccm. of KCNS solution (0.06 per cent.) was added to each. (*a*) To five of these tubes oil of cassia was added in exactly the same proportions as those in the tubes of the second series. (*b*) To the other five, 0.5 per cent. carbolic acid solution was added in the same proportions as those in the tubes of the second series. Glass strips were inserted. After incubation it was found that scum formations occurred in the tube containing only 1 ccm. of 0.5 per cent. carbolic acid (0.05 per cent.). Perhaps, judging from the negative outcome in the second series, the KCNS actually helped to stimulate bacterial growth in this case! Plaque formation failed to occur in any of these tubes.

IV. *On plaque formation on, and decalcification of, natural extracted teeth suspended in inoculated culture media.*

This series was conducted for the purpose of studying possible plaque formation on natural extracted teeth suspended in inoculated culture medium, and to ascertain, if possible, whether any calcium is extracted from teeth under such conditions.

(1) *In the presence of glucose.* Two sets of tubes were arranged. One set of four tubes contained only the inoculated culture medium; a second set of four tubes contained 7 ccm. of the inoculated culture medium with 3 ccm. of a 2 per cent. solution of glucose in each. Teeth were suspended in each of the eight tubes. Two "controls" were made for each set.

The teeth we employed in these experiments were furnished by Dr. W. B. Dunning. They were natural extracted teeth, with cleaned surfaces and with cavities and roots covered with black paraffin (containing lampblack). The teeth were kept in glycerol until they were used. The glycerol was washed off with sterile water before the teeth were placed in the inoculated media.

All of the teeth of this series were suspended in about the *center of the medium.* After two weeks' incubation the teeth were examined for plaque formation. None was found on the teeth themselves, although a white slimy growth was abundant at the top of the cultures. The teeth were flushed with water and their surfaces scraped. Microscopic examination showed that the scrapings contained no special collections of bacteria.

In testing for calcium, the collected contents of the two sets of tubes were analyzed separately. The control media were also analyzed for calcium. The albuminous matter was removed from the solutions, after boiling, by the addition of acetic acid, and the calcium was precipitated as calcium oxalate. The filter holding the latter precipitate was incinerated. The ash was dissolved with dilute HCl solution, the liquid neutralized, and the calcium re-precipitated as oxalate. The amount of calcium in the precipitate was ascertained by titrating the acid solution of the precipitated oxalate with *n*/20 potassium permanganate solution at a temperature of 70° C. The results obtained thus far in this particular connection are summarized below:

	Control medium.	Medium cont'g teeth (4).	*Gain* of CaO.
Culture medium—	CaO in mg.	CaO in mg.	CaO in mg.
Inoculated—40 ccm.	1.23	1.84	0.61
Plus *glucose*, inoc. —40 ccm.	2.09	3.94	1.85

The comparative results showed an increased content of calcium in the tubes containing the teeth. The relatively large increase of calcium in the mixtures to which carbohydrate had been added was due, probably, to the *acid* formed in the bacterial hydrolysis of glucose.

(2) *In the presence of KCNS.* The experiments described in the preceding section were repeated, but KCNS was present (0.006 per cent.) instead of glucose. The growth results were similar. The results of the calcium determinations are appended:

Culture medium (20 ccm.) plus KCNS—	CaO
Inoculated (control)	1.78 mg.
" and cont'g *two teeth* ..	3.73 "
Loss of CaO from the teeth	1.86 "

(3) *In the presence of protein (meat or gelatin).* This series consisted of a group of tests to determine the effect of meat and gelatin in the inoculated culture medium. Two tubes, each containing 10 ccm. of inoculated culture medium and a few fragments of meat, and two with 5 ccm. of 2 per cent. gelatin solution and 5 ccm. of inoculated culture medium in each, were arranged with the teeth suspended *at the tops of the media,* where abundant growth occurs. A control was made for each set. In the tubes in which pieces of meat were placed, excessive putrefaction took place. Plaques formed in both sets of tubes, but they could be easily removed from the teeth by flushing them with water.

V. *The influence of mucin on bacterial growth and plaque formation.*

In the first portion of our study of the possible influence of mucin we used crude mucin precipitated from saliva by alcohol. In the second portion of this study the mucin was obtained by precipitation from saliva with dilute acetic acid.

(1) *Studies with sterile saliva and with crude mucin precipitated from saliva with alcohol.* The precipitate that was obtained from saliva by treatment with an excess of alcohol was filtered off and dissolved as completely as possible in water. Solution was facilitated, although not rendered perfect, by warming the mixture. Five ccm. of the unfiltered sterilized mucin solution were poured into each of four tubes containing individually 5 ccm. of inoculated culture medium. One tube of *sterilized saliva* was inoculated for comparative purposes. Teeth were suspended *at the tops of the media.* Controls were made. Growth occurred in each tube, but least of all in the tube in which sterile saliva was used in place of the mucin solution. The bacteria could readily be flushed from the teeth with water.

A tube of sterile saliva and one of mucin solution were inoculated to ascertain whether they would be satisfactory media in which to cultivate salivary bacteria. In both cases agar slants showed that growth was positive, but in neither case was the growth so abundant as with the broth. The sterile saliva was less nutritive than the mucin solution.

(2) *Studies with mucin precipitated from saliva with dilute acetic acid.* The precipitated mucin was dissolved in a slight excess of 0.5 per cent. Na_2CO_3 solution. The experiments described in the preceding section were repeated with this solution instead of the aqueous mucin solution. Plaques occurred, but, as in the other cases, they did not adhere tenaciously to the teeth.

VI. *Further data pertaining to decalcification.*

At the conclusion of the foregoing experiments, additional mixtures in which teeth had been suspended were subjected to analysis for calcium. Corresponding control determinations were also made. The results are briefly summarized below:

(1) *Culture containing mucin precipitated with alcohol.*

	CaO.
Culture medium (20 ccm.) plus mucin—	
Inoculated	1.91 mg.
" and cont'g *two teeth*	1.91 "
Loss of CaO from the teeth	0.00 "

(2) *Culture containing mucin precipitated with acetic acid.*

	CaO.
Culture medium (12 ccm.) plus mucin—	
Inoculated	3.36 mg.
" and cont'g *two teeth*	4.35 "
Loss of CaO from the teeth	0.99 "

VII. *General morphological examination.*

A general morphological examination showed that the bacteria were Gram positive, mostly of bacillus form. They were *acid-producing* when grown in litmus milk. The decolorization of the litmus that ensued in the milk, and the strong decomposition of meat placed in the culture medium gave evidence of the presence of putrefying bacteria.

VIII. *General facts pertaining to plaque formation.*

On some of the glass strips the plaque formation consisted of small, granular, jelly-like masses. On others the masses were relatively large, translucent, and jelly-like. On some strips the mass was an undifferentiated white homogeneous scum. On some strips the gelatinous masses were seen to consist of thread-like forms. In practically all of the tubes in which teeth were suspended, plaques were formed, but they adhered much more closely to the wall of the tube than to the teeth.

Respectfully submitted,

EMILY C. SEAMAN,
WILLIAM J. GIES.

It will be seen that certain of Dr. Gies' findings, notably with regard to the sulfocyanate tests, are not in harmony with the findings of the Research Committee for 1909, and it is hoped that in the discussion this discrepancy will be fully considered.

Respectfully submitted,
WM. B. DUNNING, *Chairman.*

Discussion.

Dr. L. M. WAUGH, Buffalo. I feel that the society is to be congratulated upon the report to which we have listened this evening, and a debt of gratitude is due the chairman of the Research Committee for having obtained the aid of a man who seems so eminently fitted to carry on the experimental work. Professor Gies, after the tests which he has been carrying on with saliva, especially in regard to mucin, must soon be able, it would seem, with the aid of dentists, to help to untangle this maze of the obscure causative factors of caries contained in the saliva.

I have a letter from Dr. Low which bears directly on the mucin question, and which I will read:

BUFFALO, N. Y., May 4, 1910.

DR. L. M. WAUGH, Buffalo, N. Y.

Dear Dr. Waugh,—Fearing that the report of the Committee on Scientific Research may have been passed before I arrive in Albany, I desire you to state for me while it is under consideration, that the experiments which I conducted this past winter seem to prove that the presence of potassium sulphocyanate in the saliva would tend to prevent the accumulation of the glutinoid smear about the necks of the teeth; at least I have proved beyond doubt that it has quite a marked effect upon pure glutin made from wheat flour.

Another interesting disclosure suggested to me by Dr. Marcus L. Ward, chemist in the dental department of the University of Michigan, concerning which I have made experiments in a very considerable number of cases, is that the sum total of the mixed saliva (that is, portions arriving in the mouth from both parotid and sublingual glands) under titrate tests have proved invariably *alkaline;* and I find further that just in proportion

as rapid superficial enamel decay is progressing about the teeth, the saliva in such mouths is most extremely alkaline. My tests have been made as follows:

To ½ ccm. mixed saliva has been added sufficient distilled water (an indefinite quantity, approximately an ounce), and the two have been well shaken together in a small flask. Into this mixture one drop methyl orange has been mixed as a detective, following which, if an *alkaline* saliva is suspected, as much *n*/10 sulfuric acid (H_2SO_4) is dropped as may be necessary to just barely neutralize the natural alkalinity of the saliva. This is indicated when upon shaking the mixture a delicate rose color permeates the fluid. If an *acid* saliva is suspected the same result will be obtained by substituting a *n*/10 sodium hydrate solution (NaOH); readings are then taken from the buret graduation to learn how many tenths of a cubic centimeter are necessary to bring about the results.

In mouths where teeth are decaying badly, often as much as three-tenths ccm. sulfuric acid solution is required to bring about a neutral condition. I have yet to find a saliva that tends toward acidity sufficiently to make an accurate reading. These experiments confirm me in the belief that bacteria as found floating in mixed saliva where rapid superficial enamel decay is present are in the habit of covering themselves with the gelatinoid plaque to prevent their lactic acid from being neutralized by these alkaline oral fluids, and that in consequence we shall always discover the most rapid enamel decay where the reaction of the saliva is most alkaline.

My calling the attention of the society to these experiments is prompted by the hope that they may be duplicated by others. It seems to me to be very important that the truth concerning these conditions should be fully established. I trust that Dr. Dunning in his experiments will not confuse excessive plaque formation with the consideration of whether bacterial growth is more or less abundant in the presence of potassium sulfocyanate in the saliva—a mistake which might easily be made.

Very truly yours,

FRANK W. LOW.

I have seen some of the cases from which Dr. Low took samples—cases in which there was the most wretched decay of teeth, the rapid progress of which was inexplicable. Dr. Low has not found the saliva in any of these cases to be acid. He has found floating masses of mucin in the saliva, these floating masses being acid; but the whole saliva has not in one single case proved to be acid; and when someone today said that perhaps very soon we might be prescribing organic acids for the prevention of caries instead of alkaline washes, he did not know, perhaps, that Dr. Low is working along that line, although his investigations are still in a formative stage.

To go back to the formation of plaques, the report to which we have listened this evening is especially gratifying to me as chairman of last year's committee, because we were fearful then of not being able to grow bacterial plaques. Dr. Black had grown them once himself, but on other occasions he could obtain no one who could, under his direction, be successful in growing them. We watched with a great deal of interest the growth of the cultures this year, and when we were informed that copious plaque formation was observed we were extremely glad, because we were confirmed in the idea that plaques could be cultivated in the media.

The report which Dr. Dunning has read would negative *in toto* the report which we made last year concerning the influence of potassium sulfocyanate upon plaque formation. Dr. Roberts, a capable bacteriologist who has taught in three universities, Niagara University, Michigan University, and the University of Buffalo, who helped us last year, could not grasp what those plaques were. After all our laboratory work was finished, although Dr. Low and I were with him almost every day in the laboratory, he could not see what we had accomplished, except that we had obtained bacterial growths; and only when we showed him the results of the introduction of potassium sulfocyanate, and its action in retarding the growth of these plaques, did it dawn upon him what we were doing. And I cannot but feel from Dr. Gies' report that he has failed to comprehend the importance of the plaque with reference to the influence of potassium sulfocyanate upon its growth.

In this I do not wish to be misunderstood, for we are after the truth. I had the slides with me of the photomicrographs which I expected to show you, but I will just describe and try to make them clear to you. I believe Dr. Gies has felt that potassium sulfocyanate was supposed to retard bacterial growth. Michaels has stated his opinion of its action on saliva. Miller stated years ago that all sorts of bacteria are present in the mouth. Potassium sulfocyanate does not seem to retard the growth of bacteria; in some of Dr. Low's tests it seemed to accelerate the growth. It is our hope to prove that its influence upon the bacteria in some way not yet understood will affect—will retard or restrain—the formation of the *plaque,* not of the bacterium at all.

To recite in brief the result of last year's work: We tried to confine ourselves to two things—to growing the plaque, and to ascertaining the influence of potassium sulfocyanate in regard to inhibiting its formation. This year Professor Gies has done a good deal, and his work is valuable. He has done much more than we did, but with the manifold aims of his investigations and his capability of experimenting along the line of mucin (which was especially mentioned last year as being worthy of further study), I feel that he has centered his attention on mucin, and has failed to grasp the fact that it is the inhibitive influence of potassium sulfocyanate upon plaque formation that we are after.

We inoculated 116 tubes, which contained culture medium such as Dr. Dunning mentioned in his report tonight. To show that the work was thoroughly done, out of the 116 tubes inoculated we had 115 flourishing growths of bacteria—and that speaks volumes for the thoroughness of Dr. Low's work. One tube was accidentally broken. We set aside 10 tubes as controls; nothing was put into them. We understand that plaque formation is now considered to occur under conditions adverse to the growth of bacteria. Their growth does not seem to require plaque formation. The bacterium is supposed to invest itself with the plaque material to protect itself from something adverse to its growth. We used, therefore, restraining agents, according to Dr. Black's suggestion—in one case an emulsion of oil of cassia, and in another a weak solution of carbolic acid.

To 44 tubes a little of the cassia emulsion was added; 20 tubes were colored with simply that emulsion; to 24 tubes small quantities of potassium sulfocyanate were added. The object was to see whether plaques would form more readily in the 20 tubes with the cassia emulsion, or just as readily in the 24 that in addition to the cassia emulsion contained the potassium sulfocyanate. Of the 20 tubes that contained the cassia, 7 developed plaques—that is, 35 per cent. Of the 24 tubes which contained also the potassium sulfocyanate, only 3 developed plaques, or 12½ per cent.

To 51 tubes carbolic acid was added; 25 tubes contained only the carbolic acid; to the other 26 tubes the potassium sulfocyanate was added. Of the 25 tubes containing no potassium sulfocyanate and only the carbolic acid, 10 exhibited plaques, or 40 per cent. In the 26 tubes containing carbolic acid plus potassium sulfocyanate, not a single plaque developed.

Of 10 tubes which contained neither carbolic acid nor cassia emulsion, but simply potassium sulfocyanate, none developed plaques.

Dr. Roberts did not even know what we were after. In fact I myself had not expected even the results obtained.

Dr. Dunning. What strength KCNS was used?

Dr. Waugh. I cannot state just now. The strength is stated in my report of last year, which Dr. Gies undoubtedly took as a basis.

That would mean, from the cold calculations of the laboratory, that we had five plaques formed without potassium sulfocyanate to one formed with it.

The report to which we have listened this evening makes the matter seem different. I would rather have the result come out like that in our report, but did not expect it. We found that plaques

were found in the cultures in the proportion I have stated. Dr. Gies states that plaque formation is not inhibited in any appreciable degree. Just what he means, I cannot tell. I think he simply looked at the tubes as they appeared under the naked eye. Inasmuch as his report is tentative, it may be modified.

I am not upholding potassium sulfocyanate; that is Dr. Low's idea. We are all looking for the truth, and if Dr. Gies, on looking over his experiments, will still maintain his position as indicated in his report, other men will have to either corroborate him or indorse the work of last year's committee, and in either case the committee of last year will be gratified.

I felt safe last year in saying that I thought men might wisely prescribe potassium sulfocyanate to study its effect clinically. I will give you the strength of the KCNS which Dr. Dunning asked for, though we cannot give the definite percentage. The average saliva on the color chart of the State Society showed a color at about 3¼. We took culture media—the uninoculated lamb broth—until we obtained that tint on the color chart, the color of the average saliva. Dr. Gies makes his records in percentage. We felt that by the above method we would get the average saliva as nearly accurately as necessary.

I am sorry that Dr. Low is not here. He would probably fight more for potassium sulfocyanate than I do. He tells me that he wants to go to New York on Saturday with Dr. Dunning, and go over Dr. Gies' work.

Without the close supervision of a dentist, no matter how competent an investigator may be in bacteriological work, in my opinion he cannot grasp what we are aiming at in the bacterial plaque. I suggested in my report that teeth be suspended in the medium, *i.e.* in lamb broth, which contains no carbohydrate. The decomposition of meat food in the mouth, nitrogenous food, could not cause decay. I said carbohydrate should be added to the meat broth, to see if decalcification would take place under its influence. The addition of the carbohydrate was to give a pabulum, an acid, to see whether decalcification could occur. Dr. Gies seemed to think that I wanted to see if carbohydrate food would cause it. I believe that in order to get what the dentist wants, a dentist must keep closely in touch with a general bacteriologist—he knows the technique that we do not know, with all its up-to-date improvements. Dr. Roberts did not know what we were after. He said, "What does potassium sulfocyanate show you?" I said, "Here are 51 tubes. Of the 25 tubes that contained only the carbolic solution, 10 exhibited plaques." He said, "Surely that will prove it."

Do not, then, go away with the idea that your committee has sadly failed in its experiments, until Professor Gies has had time to look over his work again. As has been said, that work is tentative only. The next two or three weeks may bring different results with reference to this important question.

Dr. R. H. Hofheinz, Rochester. Where there is such a discrepancy, it is unnecessary for the layman to introduce himself. I want, however, to ask Dr. Waugh regarding the alkalinity of the saliva which Dr. Low has found in cases of extensive enamel caries. Is it known to Dr. Waugh whether that alkalinity of the saliva existed before the enamel caries took place, or after? I think it a very vital question, particularly vital in regard to Miller's statements, whether the alkalinity existed before the existence of the caries, or whether, later on, the microbes have protected themselves in some manner against the strong acidity of the saliva.

Dr. Waugh. You mean the strong alkalinity?

Dr. Hofheinz. There must have been some acidity to produce primary caries. I wanted to know whether it was proved that the saliva was alkaline during the time the extensive caries occurred, or afterward.

Dr. Waugh. Dr. Low's active experiments have covered a period of five or six months this winter. He has experimented in his practice on patients who

exhibited that white, rapid enamel caries which seemed beyond his control either with potassium sulfocyanate or with the prophylaxis method of treatment, these patients being nervous girls going to school and working hard, and nervous persons who are engaged in exhaustive indoor work. The alkalinity is present now, and the caries is going on as rapidly as before. Whether that alkalinity existed prior to the time when he began his tests, six months ago, he cannot tell; but the carious process is going on most rapidly in those mouths that give the strongest test for alkalinity.

In the alkaline saliva, large, jelly-like masses are floating, which when separated prove to be mucin. These masses are acid, but the whole saliva, churned up, is alkaline. Dr. Low expected to find acid saliva. We have always maintained that in mouths with acid reaction of the saliva there is less caries. Dr. Low has not found an acid saliva, and he has tested many mouths in which there was no caries. We made all tests with litmus, and prescribed antacid mouth-washes when we obtained the reaction with litmus. Dr. Low thinks that we must have held the litmus too near the mucous membrane, so that the secretions from the follicles were poured upon the litmus, when we obtained that reaction.

Dr. H. C. Ferris, Brooklyn. To complicate matters a little more, let me say that Dr. Gies made a report of 19 examinations of immune subjects selected by dentists, in whom he found an acid index of 7.9. In 39 cases of caries he found the acid index to be 6.8. In 19 cases of erosion he found the acid index to be 8.8, and in 12 cases of pyorrhea an acid index of 10 was shown. That somewhat varies from Dr. Low's findings; it was undoubtedly a test of the saliva as a whole. He tested it with a very delicate solution of $n/200$, instead of $n/10$ or $n/40$.

He also showed in his sulfocyanates a very peculiar relation. In the immunity cases, out of 16, he found one part in 40,000—or even more delicate than that, in 39 cases of caries he found the sulfocyanates decreased to 48. In erosion a decrease to 38 was shown, and in pyorrhea a decrease to 20.

His experiments were very carefully carried out, but I believe, as Dr. Waugh had said, that biologists and chemists who undertake this work need the criticism of the practical dentist. They do not seem able to grasp the point we are after. If we make the examinations that Dr. Gies reported, I believe any addition of another chemical to the combination would give us an entirely different result. If 1/1000 part of lactic acid be added to the sulfocyanate, its effect on mucin would produce entirely different results. There are a dozen substances in the chemical consistence of saliva, and we must consider it more in combination than in separate substances.

Dr. Gies made the following statement before the New York Institute of Stomatology in reference to litmus tests: He showed that litmus paper showed an alkaline reaction, while phenol-phthalein showed an acid one. Since then I have found in my laboratory that saliva would react alkaline to litmus and acid to phenol-phthalein, and it would react acid to litmus solution—showing that the fiber of the litmus paper altered or took up some part of the compound of the salivary secretion. Since discovering that, I have asked a pathologist, who stated that that had been frequently noted, for which reason the use of litmus had been abandoned.

Dr. Dunning (closing the discussion). Dr. Waugh laid a good deal of stress upon the reaction of saliva. Dr. Gies, as I understand his report, was not speaking so much of the reaction of saliva, but of the fact that he discovered that the bacteria found in the plaque material were acid-producing; and as we all know, these bacteria are entangled in the substance of and are sheltered by the plaque. It would seem, therefore, quite possible for an acid condition to exist at the surface of the enamel under the plaque, while the teeth were bathed in an alkaline saliva; that is, the two conditions could exist at the same time and without invalidating Dr. Gies' statements.

With reference to the KCNS, it seems extremely important to establish that on an absolute basis of comparison. Dr. Gies told me that he had observed the strength of KCNS in ordinary saliva to vary from 0.003 per cent. to 0.013 per cent.—the maximum figure being extreme, but occasionally found in the mouths of smokers. In his tests he employed solutions containing 0.048 per cent. of KCNS, which seemed to him to carry his conclusions beyond any probable mistake; and with regard to this part of the report, Dr. Gies does not speak in a tentative way. There are certain experiments which are not yet completed, but the sulfocyanate tests are apparently conclusive.

The results of these experiments show that KCNS in amounts greater than those that occur in saliva has no appreciable inhibitory influence on salivary bacteria nor on plaque formation. Dr. Waugh is interested in its possible inhibitory effect on plaque formation. Dr. Gies is convinced that it has no such inhibitory effect on plaque formation. Further experiments will either confirm or refute Dr. Gies' findings. We all are very anxious to find the truth, irrespective of who finds it.

Dr. Ferris spoke of the importance of the supervision of a practical dentist. We all appreciate the importance of special dental knowledge in this work, but here the personal equation comes in very largely. A dentist must have considerable familiarity with scientific methods in order to follow these tests, and I am entirely frank to say that in this respect your chairman this year found himself unqualified. He merely kept in touch with Dr. Gies. Dr. Waugh and Dr. Low are practically conversant with laboratory methods. The practicing dentist is not apt to be very much of a scientist. He cannot be and at the same time be much of a dentist. In making this general statement, I am aware that we may be proud of certain distinguished exceptions among the members of our profession; but that these are rare as well as distinguished, I believe no thoughtful person will deny.

Dr. Wm. Carr, New York, chairman of the Law Committee, then read the report of that committee.

Dr. Dunning moved that the report be accepted.

The motion was carried.

President Nash. The chairman of the Executive Committee asks consent to place a resolution before the meeting.

Dr. A. C. Rich, Saratoga Springs. This matter seems to be important enough to be brought up and passed upon at this evening's session.

Dr. Rich then moved that a resolution be sent to the assembly protesting against the passage of Assembly Bill No. 1421, which provides that fines recovered in prosecution of illegal practitioners in Greater New York shall not go to the Society of the State of New York.

The motion was carried.

Dr. J. O. McCall, Binghamton, then read the report of the Dental Hygiene Council, making the following introductory remarks:

This is more than a simple report. It is a statement of the organization of the Dental Hygiene Council of New York, of what this council aims to accomplish, and how it proposes to go about it—matters which I believe have not been properly put before the profession in this or any other state.

Report of the Dental Hygiene Council.

This report has been formulated not only to give an account of the activity of the Dental Hygiene Council during the past year, but also with the object of giving information and making suggestions as to organization, working methods, etc., which may be of benefit to similar committees in other states.

This council was established by vote of the State Dental Society upon presentation of a report from the Sixth District Society in May 1909, as shown by the appended excerpt from the proceedings of that meeting:

Report on the Establishment of a Dental Hygiene Council.

The Dental Hygiene Council of New York State shall be made up as follows: Six members from the State Society, two members from each district society. Other dental societies of three or more years' standing within the state shall be invited to appoint one member each to serve on the council.

The first appointment shall be for two years. After that, appointments shall be for four years, and shall be so arranged that the terms of three members from the State Society and one from each district society shall expire every two years. Members may be reappointed. The members of the State Society appointed when this plan is adopted shall constitute the Executive Committee of the Dental Hygiene Council until the organization of that body, after which the Executive Committee shall consist of the officers of the council and the chairmen of the subcommittees. District and local societies shall appoint members to serve on the council at their next semi-annual or annual meeting following the adoption of this plan. All appointments shall be subject to the approval of the Executive Committee, or those members of it whose terms hold over.

The object of this council shall be the maintenance and betterment of the national health, especially through the agency of dental hygiene, and the advancement of the dental profession. This council shall report annually to the Dental Society of the State of New York, and shall not be discharged except by a two-thirds vote of that society.

The founding of such a body was sought by those whose observations of conditions among the poor, the inmates of state institutions, and especially the children of nearly all classes, had convinced them that dental hygiene is a physical and economic necessity both for the individual and for the nation, and moreover that for the broad success of a dental hygiene movement, three things are essential: First, an effective organization; second, an educated public opinion; third, assurance that the actuating motives of our profession are altruistic.

The following members of the state society were appointed to serve on the council: J. O. McCall, W. A. White, T. P. Hyatt, C. M. Dunne, A. H. Merritt, and H. L. Wheeler.

Pending the appointment of members from the district and other societies, the members first appointed decided to do what might be possible to arouse the interest of the profession and the public throughout the state, and thereby make at least a beginning toward the accomplishment of the broad aim of this movement. It was decided that of the several fields of activity proposed for the work of this council, that of dental hygiene for the school child was the one in which public and professional interest could most quickly and thoroughly be aroused. It was planned that wherever the interest of the profession could be sufficiently aroused the co-operation of the local board of education should be secured to the end of having a lecture on "The Teeth and Their Care," given by a member of our profession in or in connection with some school. For the basis of this lecture the council would furnish a lecture written by Dr. Hyatt and modified by Dr. Dunne, illustrated with lantern slides. This lecture would then be followed by examinations of all the mouths in some one school in the city for the purpose of corroborating the statistics obtained elsewhere, and more especially to impress on the parents in that community the need of dental hygiene in their midst. Where possible, this should be followed by the establishment of a free clinic, or other means of caring for some of the defects found. It was desired that the examinations when made should be recorded on cards designed by this council, so that statistics could be readily compiled from examinations conducted in other places, and also that it might be possible to ascertain the results of any dental work done, as shown in the records of physical conditions and school work.

It must be borne in mind that the need of dental services among the poor and middle classes far exceeds the possible supply of those services, even supposing that a very considerable portion of every practicing dentist's time were given up to work in a free clinic. One object, then, of our movement is to secure the establishment and complete maintenance

of free clinics by city, state, or federal governments—the accomplishment of which object with our present form of government can only be expected in the dim future, and then only through the education of the general public. To attempt to cure on the scale required is, however, only to beg the question, for, aside from the fact that our ideal should be prevention rather than cure, we should be in the position of pursuer in a stern chase, and a stern chase is proverbially a long one. In other words, we are at present largely endeavoring to cure defects in organs which, generation by generation, show less resistance to the invading forces of disease. The teeth of the nation will soon be giving way faster than we can repair them. Our efforts, then, must be directed not only toward securing attention for the defects staring us in the face, but toward checking the growing stream of caries, pyorrhea, malocclusion, and what not, at its source.

The source of this mass of disease in the ultimate analysis lies undoubtedly in the habits of the nation—the lack of proper care of the teeth, and still more the lack of the proper use of the teeth superimposed on the degeneration accompanying the physical inactivity and insufficient oxygenation of city life. Not to use the teeth is to lose them. Our educational campaign, then, must be not only a campaign for the use of the toothbrush, but for the use of the teeth themselves—the thorough mastication of food that requires mastication.

Education must be our watchword, and to have our educational campaign carry conviction it must furnish the proof of what dental hygiene can do as a conserver of general health, of the teeth themselves, and last but not least, of the pocketbook. It thus becomes evident that we need to supplement our lectures, our exhibits, our school examinations, our chapters in physiology text-books, with free clinics which will furnish facts and not theories with which to weight our arguments, and which will in addition show our motives to be worthy. This, broadly speaking, is the great field for the free clinic of the present day, and it is the belief of this council that a comparatively few clinics carefully conducted and maintained for a term of years will do more to advance the ultimate cause of dental hygiene than a large number established through a momentary enthusiasm and soon allowed to lapse. In other words, this council, while it indorses humanitarian motives, must deprecate the establishment of any free clinic which, through inability to follow up the patients treated and ascertain the physical and mental results of each treatment, is not capable of advancing the dental hygiene movement in its broad aspects.

The position of the medical profession as the chief arbiter in the field of health, and our position as specialists in that profession, make it very important that in any campaign directed toward the general health we should have the understanding and co-operation of our medical *confrères.* The aid which the medical profession can give in such a campaign of education renders this understanding and co-operation not only a thing of importance, but well-nigh a necessity.

Taking all these points into consideration, the executive committee has laid out the following tentative plan of action, the council for the sake of convenience and effectiveness being divided into subcommittees.

The Committee on Child Hygiene will be the largest and its work the most important. It will endeavor to improve dental conditions among the school children, teach the physiology of the teeth and mouth, teach properly how to care for them, and how properly to use them. This will involve the systematic and state-wide examination of school children's teeth, to show them, and through them their parents, what a high percentage of dental defects exists, and why these defects are detrimental to their health. Leaflets of an educational character will be distributed to be taken home and read. Efforts will be made to have adequate treatises inserted into school text-books of physiology. Talks will be given on the care and use of the teeth,

and the teachers will be asked to cooperate in teaching the children to take proper care of their teeth. As rapidly as possible arrangements will be made to treat the teeth of needy children in free clinics or in other suitable manner.

The Committee on Lay Education will be concerned with the education of the public as to the importance of the teeth in the physical economy. It will be seen at once that the work of this committee is very closely related to that of the Child Hygiene Committee. It will prepare the leaflets on the care and use of the teeth, and the literature for insertion in physiology text-books, and will in this way work through the Committee on Child Hygiene. It will in addition conduct an active campaign of education, by means of popular talks, a traveling exhibit on dental hygiene similar to the one now maintained in Massachusetts and analogous to the traveling tuberculosis exhibits, and a publicity campaign through the press and magazines.

The Committee on Medical Profession will point out to that profession the importance of the mouth as a factor in disease processes, and will endeavor to arouse a greater interest among the medical men in regard to the teeth. Its work will be directed toward having more detailed instruction in dental science given in the medical schools, and toward encouraging the reciprocal reading and discussion of papers before the societies of the two professions. Invitations will be extended to members of the medical profession to become members of this council. While much of the work of the council has necessarily been of a preparatory nature, something has been accomplished in the carrying out of the program outlined earlier in this report. In addition it may be noted that this year has seen an increased activity in the direction of providing free dental services, which activity, while not perhaps attributable directly to the influence of this council, has been inspired by the same sentiments which were responsible for the formation of this council. These movements, where regularly organized, have in a measure been allied with this council through the use of the charts prepared by this body for such work.

The following is a report of the work done during the year: Plans were laid for meeting and as far as possible forestalling the opposition which from previous experience had been anticipated in approaching school authorities from whom we have much to ask. The timeliness of this movement is shown by the fact that we have not so far encountered opposition, but on the contrary have been received with cordiality. The New York State School Teachers' Association extended to Dr. Dunne an invitation to speak on "Dental Hygiene in the Schools." His address given at the annual meeting of that body held in Syracuse in December was subsequently published in one of the leading educational journals, and it is safe to say that it has done and will do a remarkable work in showing the teachers and school officials of this and other states what the dental hygiene movement really is.

A chart was designed and plates for printing the same were made as shown. [Reproduced on pages 1155 and 1156.] It was the purpose of this body to prepare a card which could be used for recording examinations and which could also be used for recording operations performed in free dispensaries, in order that all information desired for statistical purposes could be found on one card. Unfortunately it was necessary, in printing a card for use in free dispensaries, to incorporate much information required on such cards under the charity law of the state. The result of this was that much space was taken up which was desired for recording services rendered.

A set of instructions for examiners was drawn up which serve as far as possible to secure uniformity of results in the examinations made in different places, and also serve to indicate to school authorities the scope of examinations and manner of making them. A set of instructions was drawn up for recording the operations in free clinics, to furnish convenient and uniform abbreviations, and to suggest uniform treatment as far as possible. A card was printed to be

given to children examined and found needing attention—

This Child's Teeth Need Attention

An illustrated lecture on "The Teeth and Their Care" has been prepared by this council, and a duplicate set of slides are available.

A dental hygiene movement along the lines suggested by this body has been started in Syracuse. Dr. G. H. Butler read a paper at the annual meeting of the Fifth District Society, in discussing which the president of the Syracuse Board of Education spoke most cordially of the movement and expressed the desire of the Syracuse school authorities to have the schools inspected. Dr. White also discussed this paper.

In Binghamton, Gen. Edward F. Jones, who for several years has furnished eyeglasses for needy school children, made a generous offer to pay for dental services for the needy children in the Clinton st. school. Dr. Dunne inaugurated this work with the lecture mentioned above, given in the public library under the auspices of the Civic Club. A committee was appointed which secured volunteers to go into the school and examine the children's mouths. Their report, condensed, follows:

School No. 9—Clinton st. Number of children examined, 209. Ages range from four to fifteen years. School graded from the kindergarten to the fifth grade inclusive. Nationality, principally American born of Slavic parentage:

Number having perfect teeth, 18—8.6%.
Number with defective teeth, 191—91.4%.
Cavities found in 191 defective mouths, 1032.
Average number of cavities per child, 5.4.
Abscesses in 101 mouths, 114.

Of the 209 children, 30 (or 14 per cent.) used a tooth-brush daily; 37 (or 18 per cent.) used one occasionally—in this latter group about one-half shared the brush with others in the family; 142 (or 68 per cent.) have never used a brush.

The principal of the Jarvis st. school reports an average of twelve tooth-aches a week in fair weather, the number in cold weather running as high as twelve a day.

Dr. Dunne has also lectured in Norwich.

The work being done in Rochester is probably well known throughout the state. Within the last year a free clinic has been organized in School No. 1, in the establishment of which clinic Dr. White has been interested.

Much valuable work has been done in New York city by the New York City Council, on which this body is represented by Drs. Wheeler, Merritt, and Hyatt. Two new free clinics have been opened this year, and a dental hygiene exhibit has been arranged for the week of May 12th–18th, at which illustrated talks will be given to 8000 children. Arrangements will probably be made to furnish tooth-powder. Dr. Merritt on April 12th read a paper on school inspection before the New York Society of Medical Inspectors. In Brooklyn a free clinic is being established, with an equipment valued at between $3000 and $4000.

The following are the appointees from the societies approved by the Executive Committee:

First District—M. C. Tracy, S. W. Van Saun, New York city.

Second District—W. N. Frazer, W. G. Lewis, Brooklyn.

Third District—C. E. Allen, L. S. Blatner, Albany.

Fourth District—A. S. Moore, Schenectady; L. A. Timerman, Fort Plain.

Fifth District—C. H. Butler, Syracuse; C. A. Sayers, Watertown.

Sixth District—H. D. Whitmarsh, Binghamton; F. M. Willis, Ithaca.

Seventh District—B. S. Hert, W. W. Smith, Rochester.

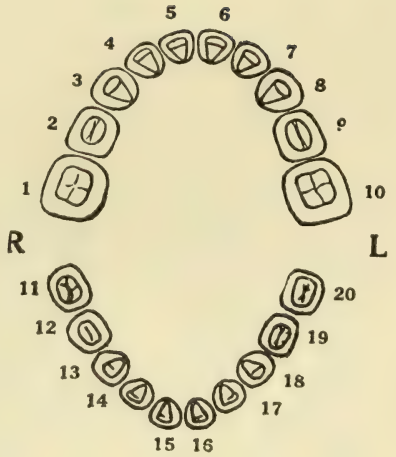
Eighth District—A. Hoffman, Buffalo; R. E. Luther, Batavia.

N. Y. Institute of Dental Technique—H. C. Ferris.

NAME _____ DATE _____

ADDRESS _____ SCHOOL _____ NO. _____ GRADE _____ AVERAGE _____





Back of card]

DENTAL HYGIENE COUNCIL OF NEW YORK STATE

SEX AGE NATIONALITY

GENERAL PHYSICAL CONDITION BLOND BRUNETTE

PARENTS

OCCUPATION M NATIONALITY M

OCCUPATION F NATIONALITY F

INCOME RENT NUMBER IN FAMILY

FAMILY HISTORY :

TEETH

CAVITIES OCCLUSION

ABSCESSES TOOTHBRUSH? YES NO

REMARKS :

THIS IS MY.....APPLICATION TO THIS DISPENSARY IN THE YEAR..... I HAVE BEEN AN APPLICANT TO NO OTHER DISPENSARY IN THE YEAR.....OR, TO THE FOLLOWING DISPENSARIES

THE FOREGOING STATEMENT IS IN ALL RESPECTS TRUE

SIGNATURE OF APPLICANT

Instructions for Examiners.

Examining instruments. Two sets, mirror, tweezers, explorer. Sterilize in lysol and alcohol. Have two glasses—No. 1, containing lysol 50 per cent.; No. 2, alcohol. When examination is finished, place instruments in glass No. 1. Take out instruments previously in No. 1, rinse them in No. 2, and use for next examination.

V-shaped pits and fissures need not be marked as cavities unless the enamel is undermined, but, when examination is made, should be treated with silver nitrate in saturated solution.

Statistics on back of chart.

"Nationality" of child determined by country in which born.

"General physical condition." Rate as good, medium, and poor; state, if possible, specific conditions, such as malnutrition, anemia, chlorosis, nervousness. Any condition bearing on the health of the child, such as tonsillar or glandular enlargement, mouth-breathing, etc., should be noted under this head.

Occupation and nationality of parents should be determined where possible.

"Income," "Rent," and "Number in Family" need not be filled out unless the cards are used for patients in the free dental clinics.

"Family history" is designed to include ascertainable points which may have a bearing on the general and dental health of the child.

Under "Teeth," give the number of cavities and abscesses. Under "Tooth-brush" mark "D" after "Yes," if child uses individual brush daily. For use of family brush mark "F" after "No." If family brush used daily mark "FD." If no brush, mark "X" after "No." Mark "X" opposite teeth prematurely extracted.

"Occlusion." If jaws have fair breadth and there is no malocclusion except slight rotation of the anterior teeth, mark "Normal." Otherwise mark "1," "2," or "3," according to Angle's three classes. Under "Remarks" give any points not already covered which may have a bearing on the general and dental health, such as gingivitis, pyorrhea, hard or soft deposits, and soft tissue abnormalities.

The *affirmation* at the bottom is to be used only when child is an applicant at a free clinic, and is to be signed by the parent or guardian.

Instructions for Recording Dispensary Services.

A day-book should be kept with provision for recording on each line—Date; Patient's name; Service; Charge, if any; Operator. *E.g.* 3/2/10, Durham, James; 3, amal.; $0.25; Jones. The number under "services" refers to tooth on chart. For individual charts, if not already filled out by examiner, see Instructions to Examiners. In addition, fill out information as to family as far as possible and send home to parent or guardian for signature to affirmation given at the bottom.

In entering operations on card, as on day-book, give number of tooth operated on; in deciduous teeth use letter D after number. Enter operations under double line in middle of card as follows: Date, tooth number, and operation; *e.g.* 4/5/10; 2D, cem.

Root-canal and other treatments may be entered on last line of space, giving only tooth number and medicine used, in order to avoid taking up too many lines for this purpose. Treatments must be entered for information of those who may follow up treatment at later sittings.

Abbreviations.

The following abbreviations are given to insure uniformity of records and for convenience in tabulating:

C. Cement.
A. Amalgam.
C.C. Copper cement.
Cop.A. Copper amalgam.
G.P. Gutta-percha.
Tr. Treat.
Cp. Cap pulp.
Oli. Oil.
Zno. Zinc oxid.
Tri.for.āā. Tricresol and formalin, equal parts.
D. Deciduous.
D.D. Dead tooth.
Eug. Eugenol.
Cl. Cleaning.
Ab. Abscess.
Ext. Extract.
X. Extracted before coming to clinic.
Tr.Pyorr. Treat pyorrhea.
G. Gold.
Kn. Killed nerve.
AsO. Arsenic.
Comp. Compound filling — cement and amalgam.
Gpp. Gutta-percha point.
Ae. Aschers Art. Enamel.
Euc. Eucalyptol.

The object for which this council is working is a big one and a noble one, one which cannot be accomplished except by the unreserved co-operation of all dentists who are interested in this movement in any of its aspects. Inasmuch as the sum total of the present available energy for this work is certainly no more than adequate for its accomplishment, this body most earnestly requests that all dentists or dental societies in this state wishing to initiate a dental hygiene campaign affiliate themselves with this council, and work as far as possible along the lines it may suggest, in order that the greatest and broadest results may be realized from the energy expended. We are living in an age not only of rapid and valuable scientific advancement, but in one of an awakening sense of civic responsibility. The scientific investigators of our profession have shown us the possibilities of prophylactic measures in preserving the teeth, they have shown us the bearing of the teeth on the general health; and it needs only logical, constructive elaboration of the knowledge put at our disposal to demonstrate beyond the shadow of a doubt the results that may be gained by a national campaign of dental hygiene.

President Nash. If there be no objection, this report will be received.

The meeting then adjourned until Friday morning at 9.30.

(To be continued.)

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

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PHILADELPHIA, OCTOBER 1910.

EDITORIAL DEPARTMENT.

MOUTH DISORDERS AND THE DEATH-RATE.

THE Census Bureau of the Department of Commerce and Labor at Washington, D. C., has recently presented some interesting information with reference to mortality statistics which should receive the thoughtful consideration not only of sanitarians in general, but especially of those who are concerned with the hygienic relations of the oral cavity.

The figures concerning the death-rate from tuberculosis, as compiled in the Census Bureau's death-rate registration for states and cities, showed a decline from 173.9 in 1908 to 167.5 per one hundred thousand estimated population in 1909. The report further states that the 1909 rate is the lowest on record for the census registration area. Corresponding decreases in the deaths from influenza and pneumonia are also reported. The death-rates from pneumonia for both the years 1908 and 1909 were lower than for any previous year of the decade. The death-rate among

children under the Census Bureau's death registration area, representing a fraction over 55 per cent. of the provisional estimated population of continental United States, showed that of the total number of deaths occurring in said area no less than 26.8 per cent. were of children under five years of age, and 19.1 per cent. were infants under one year of age. "In general, one death out of five that occurred during 1909 was of an infant under one year of age, and a little more than one death in four, or about 27 per cent., was of children under five years of age."

The report goes on to state that "The early years of life are of special importance, not only because of the large number of deaths that occur therein, but also because, perhaps in greater proportion than that of any other period of life, a great part of these deaths are entirely preventable, and the causes which produce them are not being successfully combated." Quoting from Dr. Arthur Newsholme, an eminent English authority, the report says: "The subject of child mortality is of national importance. Infant mortality is the most sensitive index we possess of social welfare and of sanitary administration, and a high infant mortality implies a high prevalence of the conditions which determine national inferiority."

It cannot be doubted that the decrease in the death-rate from tuberculosis, pneumonia, influenza, and respiratory disorders in general has been brought about by the application of better and more sanitary methods of living and by the application of a wider knowledge of the nature and origin of these disorders to the prophylactic methods of combating their invasion. In this general direction much important and valuable work has been done. There is an aspect of the question, however, which only in its broad general relations has received any attention at all, one which is of sufficient importance and magnitude to demand close study and investigation as a hopeful means for still further diminishing the death-rate from these scourges. Years ago, Miller, in his classic series of researches entitled "The Human Mouth as a Focus of Infection," called attention to the oral cavity as the habitat and breeding-ground of many of the micro-organisms which were the exciters of definite pathological states, but in particular he called attention to the prevalence of the pneumococcus as a more or less constant inhabitant of the mouth cavity.

Various observers have confirmed the findings of Miller with respect to the general prevalence of the pneumococcus as an inhabitant of the mouth, in some cases placing the number of cases in which the pneumococcus is habitually found even as high as 95 per cent. A variety of other pathogenic bacteria, among them the tubercle bacillus, have been found to invade the oral cavity with a constancy analogous to that characterizing the pneumococcus, and students of the bacteriology of the mouth have definitely proved that the number and variety of these disease-producing organisms bear a very definite relationship to the cleanliness or otherwise of the mouth and its contained organs.

Attention has been so definitely called to this general question, and the evidence is so convincing, that it is high time that the importance of maintaining a hygienic condition of the mouth should be broadly recognized and the doctrine of oral cleanliness be promulgated as a health measure, not only by the dental profession but by all of the agencies now concerned in the effort to secure a better national health standard and to reduce the national death-rate. Much of the instruction with regard to oral cleanliness is promulgated not from the point of view of its importance as a health measure, but rather from its esthetic desirability—which is all very well as far as it may go; the fundamental question, however, is not one of appearance or primarily of comfort, but of health and life. People are constantly carrying about in their mouths masses of pathogenic bacteria ready at hand to invade the organism at any moment when its internal resistive forces may be temporarily lowered. They are carrying about in their own organisms a potential source of self-destruction no less dangerous than if these same organisms were a virulent poison or a high explosive only waiting the opportunity furnished by suitable conditions to carry out their deadly work.

The practical application of our accumulated scientific knowledge with regard to the human mouth as a focus of infection in relation to the prophylaxis of those diseases which distinctly have their source of origin in mouth infection—and among these must be included tuberculosis and pneumonia—can never be successfully accomplished until all of the forces and agencies now at work in the endeavor to solve the problem of higher vital standards in the nation have come to realize the necessity for oral

prophylaxis, and have adopted means for educating the public up to its practical realization.

One other aspect of this broad question which is brought out by the Census Bureau report relates particularly to the question of the high rate of infant mortality. It is a notable fact that the relatively high death-rate among children occurs distinctly during the first dentitional period. It has also been definitely proved, in so far as clinical evidence and logical reasoning from clinical evidence can arrive at a definite conclusion, that difficult or disordered dentition may and does so disarrange the nervous organization of the infant and young child as to seriously disturb its nutritional mechanism, reduce its vital resistance, and make it an easy subject for the invasion of disease-producing organisms which set up their pathogenic activities in the gastro-intestinal tract and produce that class of disorders which are characteristic of the dentitional period, and which are responsible for the high rate of mortality everywhere recorded in connection with the early years of existence.

We are firmly of the opinion that the high rate of child mortality will never be materially reduced until those who are charged with the responsibility of mitigating the conditions which surround the growing infant are made to clearly comprehend the relationship between difficult dentition and infantile disorders, and to learn by practical experience the beneficent and life-saving virtues of the gum lancet when intelligently and skilfully used in these cases.

It is in the foregoing aspects of the question that the members of the dental profession everywhere are concerned. It is they who are in position by their special training and by their personal influence to bring these matters to the attention of physicians and of the authorities now fully awake to the necessity for active work in reducing the mortality figures of our country. The end sought cannot be accomplished by talk or arguments based upon glittering generalities, but by the individual effort of those who have an intelligent comprehension of the etiology, pathology, and prophylaxis of the disorders here under consideration.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Lancet*, London, July 23, 1910.]

DENTAL TREATMENT OF LONDON SCHOOL CHILDREN. EDITORIAL.

The Children's Care Subcommittee of the Education Committee of the London County Council issued its report on July 20th. The experience gained with regard to the dental treatment of children at Cambridge and elsewhere having shown that the number of carious teeth open to conservative treatment decreases as the children advance in age, and that treatment for children in the last year of school life is much more serious and expensive than in earlier years—the serious increase in the number of children with caries of the permanent teeth taking place between the ages of seven and one-half and eight and one-half years of age—the subcommittee proposes that a beginning should be made by providing treatment for such children, accepting the experience of Cambridge that 73 per cent. between these ages require dental treatment. In round numbers there are about 80,000 children between the ages of seven and one-half and eight and one-half years attending London elementary schools, and of these probably 60,000 require treatment. The British Dental Association being unable to undertake the work for the council, the subcommittee is considering the desirability of arranging for the work to be done by private dentists in their own surgeries, and also whether it would be possible for the London hospitals to make special provision for dental treatment. It reports that two offers have been received which would enable the council to obtain experience in dealing with the problem. The Poplar Hospital for Accidents will provide treatment at the rate of £50 a year for a dentist working one-half day per week, with 2*s.* for each case. The facilities offered would secure treatment for 2200 children. A committee in Deptford has offered to provide treatment at a local surgery on two half-days a week without charge to the council, and to charge the parents for treatment in accordance with the council's scale. On the assumption that 3500 cases a year would be treated, the cost to the council would be £750 a year. These two schemes would secure treatment probably for 5700 children for approximately 4*s.* a case. On this basis 60,000 children would cost £12,000 a year, exclusive of grants for equipment. The subcommittee recommends that advantage be taken of these offers, and that for the present the selection of the children for treatment should be made by school medical officers. The stage reached, therefore, is that 5700 children are to be seen once in twelve months.

[*Deutsche Monatsschrift fuer Zahnheilkunde*, Berlin, May 1910.]

FAILURES IN SURGICAL ROOT-TREATMENT (RESECTION OF THE APEX), AND THEIR CAUSES. BY DR. EULER, HEIDELBERG.

Since a whole special literature on the subject of resection of the root-apex has been written within the last few years, ranging from the advocacy of this operation under all conditions to its unconditional reprobation, the author's *résumé* of the factors entailing its unsuccessful performance is very timely and acceptable. The success of the surgical treatment of the root is entirely problematic if the root-canal has not been properly treated, especially if it has not been filled completely, if the affected approximating teeth are not duly considered, if the affected osseous portions are not thoroughly removed, if maxillotomy is performed when resection of the apex would have been indicated, if in incisors an excessively large portion of the root is resected, if by the surgical interference an atrophy of the alveolus of the tooth involved is set up, or if a mistake in diagnosis is made. The success of surgical treatment may be partially impaired by insufficient anesthesia, by swelling, by after-pain, by hemorrhage, by tardy healing, by injury of the antrum or of the mandibular canal with its

contents. A superficial glance at the points enumerated suffices to show that failures are mainly due to imperfect technique, the last few items mentioned, such as swelling, hemorrhage, and after-pain, being of very secondary significance. The author consequently reaches the conclusion that, even upon most careful scrutiny from the negative point of view, resection of the apex of the root loses nothing of its value and importance.

[*Journal of the American Medical Association*, Chicago, May 7, 1910.]

GINGIVITIS IN DIABETES. Editorial.

The importance of mouth symptoms in the acute infections, such as scarlet fever, diphtheria, and measles, is recognized. It is less generally known, however, that in many constitutional conditions the mouth secretions and the mucous membranes covering the gums, cheeks, tongue, etc., furnish early and positive data for diagnosis. It has been proved that gingivitis is an early and prominent symptom in many cases of diabetes mellitus, and continues throughout the course of this disease. Many good books on general medicine ignore this fact, however. Osler, who seldom misses a point, makes no mention of it in diabetes, but does say that "The tongue is usually dry, red, and glazed, and the saliva scanty; the gums may become swollen, and in the later stages of the disease aphthous stomatitis is common." J. Redier makes the definite statement that in diabetes the saliva contains sugar, which undergoes lactic fermentation, in consequence of which both the teeth and the gums suffer. G. Lemoine thinks that the complications of diabetes involving the digestive apparatus are far from rare, especially the mouth complications. "Among the more frequent," he says, "is gingivitis of the simple congestive, suppurative, or expulsive type; this gingivitis seems due to the rapid multiplication of microbes in the buccal cavity." Ludwig Brandt says that alveolar atrophy begins around the incisors of the lower jaw, which have the weakest roots and the most delicate alveolar lamellæ. He mentions especially the influence of disorders of nutrition on pyorrhea, and cites as constitutional causes mercury taken as a medicine or introduced into the system by constant handling, diabetes, rheumatic and acute arthritides, scurvy, syphilis, tuberculosis, and certain nervous diseases, such as neurasthenia, tabes, and progressive paralysis.

The first symptom of gingivitis is usually a sensation of itching and burning in the gums, which is sometimes disquieting enough to bring the patient to the physician, when careful examination may discover one or more loose teeth. Suppuration may not be present at this time. At a later stage little or no pain is present, but there is marked retraction of the gums, loosening of all the teeth, and the oozing of pus from the tooth sockets. In later stages the teeth drop out or must be extracted.

It is interesting to note that the onset of both pyorrhea and diabetes takes place most frequently between twenty and thirty years of age, and that males are the more frequently affected. The upper jaw is more resistant than the lower, and the disease usually begins around the lower incisors, as already mentioned. The treatment is of course essentially constitutional, supplemented by local applications.

It becomes a matter of extreme importance, therefore, that the general practitioner shall examine the mouths of all patients, taking careful note of the mucous membrane of the cheeks, beneath the tongue, on the tongue itself, the roof of the mouth, and especially the gums.

[*Zeitschrift fuer Zahnaerztliche Orthopaedie*, Berlin, May 1910.]

SIGNIFICANCE OF RESPIRATION AS AFFECTING THE POSITION OF THE TEETH. By Emil Herbst, Bremen.

If Nature is to build up such a complicated apparatus as a denture with normal alignment of the teeth, normal forces must be at her command. Any partial presence or total absence of these normal forces is reflected in abnormal dentures. In its eruption, the tooth, after having developed its crown within the alveolar process, is pushed through the gingivæ by pressure of the tissues, until it is prevented from farther progress by the pressure of mastication from the antagonizing tooth. Lingually the tooth is guided by the tongue, labially and buccally by the lips and cheeks; mesially and distally the position of the tooth is determined by its neighbors. Any disturbance in the equilibrium of

these forces involves an anomaly. The pressure of the soft tissues, *i.e.* tongue, lips, and cheeks, is normal only when the mouth is closed. The mandible, carried by the external pressure of the atmosphere, as it were, adheres to the maxilla, the soft tissues being forced to adhere to the hard ones. This normal adhesion of the mandible is present only when respiration is normal, that is, when the nose is unobstructed. In partial nose-breathers, therefore, especially when nose-breathing is imperfect during the periods of eruption of the teeth, anomalies in the position of the teeth are to be expected. The causes which disturb normal nose-breathing are either diseases or habits, the diseases consisting in nasal, pharyngeal, and laryngeal stenoses, the habits in thumb-sucking, biting of the lower lip or tongue, sucking of the cheek, etc. The diseases mentioned frequently produce chronic stenoses that force the patient to breathe through the mouth. Children's diseases or diseases of faulty metabolism may also produce respiratory stenoses, which in most cases eliminate the air-pressure, the most essential factor in the alignment of the teeth, and consequently disturb the equilibrium between the pressure of the tissues, the mastication, and the air. The conditions for a normal alignment of the teeth thus being disturbed, abnormal positions of the teeth are to be expected, consisting chiefly in narrowness of the jaws (arthresia), prognathism, and protrusion of the maxilla.

[*Rivista Trimestrale di Odontojatria e Protesi Dentaria*, Milan, July 1910.]

TREATMENT OF PULP RESIDUES IN THE CONSERVATIVE TREATMENT OF TEETH. By Prof. Dr. G. Fasoli.

If a tooth remains sensitive to percussion after devitalization, or if in a filled tooth a non-septic process of irritation sets in at the apex, or if from the effects of formalin or some other volatile drug a reaction of the pericemental tissues takes place, Fasoli recommends the introduction of a strand of cotton saturated with a concentrated alcoholic solution of carbolic acid mixed with an alcoholic solution of iodin. This is sealed hermetically in the tooth with gutta-percha or, still better, with Fletcher's cement. This dressing will bring the tooth back to a normal condition, especially if the dressing is left in for several days or is renewed. The penetration of the iodin into the dentinal tissues and through the apical foramen brings about a salutary leucocytosis, by which the equilibrium in circulation is re-established, the injurious material is resorbed, and cicatrization of the inflamed area is brought about.

[*Deutsche Monatsschrift fuer Zahnheilkunde*, Berlin, June 1910.]

THE ORAL CAVITY OF MATERNITY NURSES—A DANGEROUS SOURCE OF INFECTION FOR THEIR PATIENTS. By Dr. G. Guttmann, Breslau.

As is well known, the genital organs of a lying-in woman offer an exceptionally favorable field for infection by pathogenic bacteria, especially streptococci and staphylococci, and for centuries puerperal fever has been one of the most dreaded complications of childbirth. Owing to the wonderful progress of prophylaxis, the rate of mortality has been reduced in maternity hospitals to 0.1 per cent., in private cases to from 0.3 to 0.4 per cent. Nevertheless, in Prussia alone from 4000 to 5000 cases of puerperal fever per annum terminate fatally; the most rigorous regulations regarding antiseptic measures are therefore being enforced among maternity nurses, —yet one very dangerous source of infection, the oral cavity, has been unduly overlooked. Recognizing this lamentable fact, the author, in spite of the great difficulties encountered, secured permission to examine the mouths of the nurses in the provincial schools for nurses of Breslau and Oppeln, with the following results: In thirty-five nurses examined who had been in practice for some time the following conditions were noted: Number of teeth present, 376; carious teeth, 191; roots present, 234; artificial teeth, 19; gingival fistulæ, 7; tartar and plaques, 26. The oral conditions noted in thirty-six nurses still in training were even more appalling. It is easily seen how great the possibility of infection is by transmission of streptococci and staphylococci from the mouth of the nurse to the mother, either by expiration or manual contact. Experiments in which cultures were made from agar slabs against which the nurses had breathed from distances of 15 and 30 cm. before and after their mouths had been put in hygienic con-

dition, also from the scrapings from under the disinfected finger-nails before and after the hand had been in contact with the mouth before and after sanitation, showed that innumerable micro-organisms, among which, besides various other pathogenic germs, may be found streptococci and staphylococci, are transmitted from the nurse to the patient by expiration and manual contact, and that careful hygiene of the mouth reduces the danger of such infection to a uniformly small degree. On the basis of these findings, the author makes the timely plea that the following rules for nurses, both in practice and in training, be adopted and rigorously enforced:

(1) Every woman on being admitted to a school for nurses, besides a medical certificate as to her general state of health, must produce a dental certificate attesting to the healthy or hygienic condition of her mouth.

(2) During her training the nurse must be instructed in the importance of oral hygiene and in the rational care of the mouth and teeth. She must especially be enlightened in regard to the dangers arising to maternity patients from any neglect of oral hygiene on her part.

(3) Every year the maternity nurse must submit to the head physician a certificate from a specially appointed dentist attesting the healthy condition of her mouth.

(4) The nurse is obliged to continually devote her fullest attention to the care of her mouth and teeth, and, especially before taking charge of a case, to carefully cleanse and disinfect her mouth.

(5) The text-books for nurses should contain a chapter on dental and oral hygiene, and the chapters on suppuration should also contain references to suppurations in the mouth, especially in connection with carious and ulcerated teeth and roots.

Dr. Guttmann's essay demonstrates most forcibly the significance of oral hygiene in a specially important field.

[*British Dental Journal*, London, April 1, 1910.]

THE PROSTHETIC TREATMENT OF TWO CASES OF PYORRHEA. By Mr. C. E. Smith, Cannes.

It is a much-discussed question with all conscientious dentists as to what is the right thing to do with a mouth in which there are only a few teeth remaining. Some think it is better for the patient and for the success of the restoration to make a clean field by extracting the teeth. Others, again, replace the lost teeth, and explain to their patients that, when the other teeth go, artificial substitutes can be added to the plate.

Opposing very strongly the ruthless extraction of teeth, the author exhibits two cases where extraction seemed clearly indicated, but where by patient gum treatment and mechanical intervention, the teeth were not only saved, but were made strong enough to retain the artificial teeth solidly.

Case 1. The patient, a lady of about sixty-five years of age, presented her lower jaw in a very bad condition, only the lateral incisors and the canines remaining, showing ravages from pyorrhea alveolaris. Around the teeth the gums were very much inflamed, but otherwise were firm and healthy. The patient informed the operator that she was leaving her dentist because he had condemned her lower teeth, and she wished them saved. She also stated that she had suffered from articular rheumatism, and that she was under treatment for that disease.

The teeth were carefully scraped with Younger's pyorrhea instruments, removing all the tartar. The pockets were washed out, first with hydrogen dioxid and then with iodin.

After each sitting the teeth were ligated as well as possible, to give the treatment every chance to succeed. The patient was recommended to give her gums energetic finger massage twice a day, and to wash her mouth with dioxid solutions.

After a few visits enough improvement was visible to indicate a permanent retaining bridge, which would hold strongly in position not only the natural, but the artificial teeth also. The natural teeth were all prepared as for Carmichael crowns, and half-crowns were made to cover the entire lingual surface of the teeth. These crowns hold very well, they do not irritate the gums, and are invisible.

The preparation for the crowns was the most difficult part of the work, for the teeth were very loose, and whenever the hold was relaxed the trepidation caused much pain.

The grooves were made by first grinding

the transverse groove with a small carborundum wheel and continuing the lateral grooves with right-angle fissure burs, worked up and down like a saw. The method of making the crown itself was decided by the impossibility of fitting the gold in the mouth, so an impression was taken of each tooth separately in soft modeling compound, cooled off by running water before withdrawing to insure its accuracy. The crown was then modeled in wax and cast. The accuracy of this system was proved by the facility with which the crowns went to their places.

With the crowns fitted, it was easy to finish the bridge. First the lateral and canine crowns were soldered together and replaced on the teeth for the final impression of the bridge.

It would have been easy in making the bridge to solder the incisors to it, but there were two objections to this—first, it would have been more difficult to hold the plate, and secondly, it would have been very hard to repair a broken tooth. A bar bridge was preferred, on which the plate rides securely. The plate was cast in gold, and the ten teeth were soldered to the plate afterward.

Some will object that this method involves too great an outlay, but with these half-crowns and the narrow gold bar to make the bridge the cost is not really an objection, and the plate would be just as successful if made in vulcanite.

Thus, by a careful study of the distribution of force and resistance, it will be seen that the bridge holds the plate, and that the plate steadies the bridge and consequently the natural teeth, reducing the fatigue to a minimum.

Case 2. This is a type totally different from the above, as the mobility and consequent suppuration were entirely due to the action of the lower teeth striking on the inclined plane formed by the lingual surface of the upper incisors.

The patient had only two central and one left lateral incisor in occlusion with the lower teeth, and these were advanced and separated. To save these it was necessary to maintain a normal articulation and to give complete immobility.

The author emphasizes immobility in all pyorrhea cases. Having tried plates with bands and hooks, silver and platinum wire, he has found that in every instance the patients were obliged to return frequently to have the bands tightened or the wires changed, and in no cases were the teeth any firmer than when these implements were attached; whereas on two occasions, where the bridges were uncemented, the teeth, if not quite solid, were found to be at least considerably firmer.

On examination of the upper jaw it was found that in addition to the three incisors there were two canine roots—much decayed but firm—also a right second molar and a left third molar. The last was a very poor tooth, else a complete fixed bridge would have been indicated.

After the usual prophylactic treatment the incisors were ground and grooved on the Carmichael half-crown plan, and cast crowns were made as described in the previous case. Two Richmond crowns were made for the canines. For these five piers a bridge of six teeth was made, extending from canine to canine inclusive, and cemented into place.

In order to further insure the retention of these teeth, a gold plate was made to carry the seven teeth and to lock the bridge and plate together. This disposition was most successful, and the plate was as firm as a bridge.

In making the bridge, the gold over the palatal side of the canine roots was thickened considerably to allow a groove being cut in the same manner as for a half-crown. Over this groove gold half-crowns were cast and placed in the mouth for taking the final impression.

The plate is now a simple gold plate of seven teeth, to which the two dummy crowns were soldered. As in the previous case, the bridge supports the plate, and the plate doubles the solidity of the bridge.

[*Archiv fuer Zahnheilkunde*, Berlin, June 1910.]

SIGNIFICANCE OF THE SULFOCYANATES IN THE HUMAN SALIVA. By Dr. A. Lohmann.

The saliva of persons relatively immune to dental caries exhibits fewer symptoms of fermentation than that of persons strongly affected with caries, and contains sulfocyanates as the essential factors of protection. In cases of abundant caries the sulfocyanates are lacking entirely in the saliva. Any such

lack or any diminution of these salts frequently indicates faulty metabolism, these salts being used up within the system. If a combination of the sulfocyanates in assimilable form is prescribed, the amount of these salts in the saliva is considerably increased and caries is retarded. Moreover, more sulfocyanates are secreted than were given *per os*, proving that by the medication the tardy formation or secretion of the sulfocyanates has been accelerated. The alkalinity of the saliva is also considerably increased, thereby retarding the growth of micro-organisms. In people who eat full-grain brown bread the frequency of dental caries is very small, and the content of sulfocyanates in the saliva is considerably greater than in people who eat white bread, in whom generally very little or no sulfocyanates can be demonstrated. It is assumed that the more vigorous mastication and the increased flow of saliva favorably influence the secretion of sulfocyanates. The author's observations, extending over several years, show that at certain times and in certain diseases caries makes rapid progress, and that during such periods no sulfocyanates could be found in the saliva, caries being retarded as soon as sulfocyanates were again present. Experiments with various combinations of sulfocyanate produced variable results, some patients exhibiting untoward results upon medication. "Cariesan," a proprietory medicine on the market, was found to be unsatisfactory, often producing vomiting or nausea. The same was noticed on the prescribing of sulfocyanate of sodium. In several cases the severity of these symptoms stood in direct ratio to the contents in hydrochloric acid of the stomach, the latter forming from the sulfocyanate of sodium, probably, sulfocyanic acid and sodium chlorid:

$$CN.S.Na + H\,Cl = CN.S.H + NaCl.$$

According to Sanarelli and Martinotti, the sulfocyanic acid split off from the sulfocyanate has bactericidal power; according to other authorities sulfocyanates in the mouth are decomposed by the oxygen forming minute quantities of hydrocyanic acid, which is said to have an enormous bactericidal power.

For successful medication the author prefers sodium sulfocyanid, NaCNS, which forms colorless crystals easily soluble in water. The sodium sulfocyanid as obtainable on the market decomposes very rapidly, for which reason the following solution is preferable:

Sodium sulfocyanid,	2.6
Aqua dest.,	10.0

Sig.—Ten drops morning and evening.

Children below fourteen years of age should take only five drops. Iron preparations must be strictly avoided. Tests for a more stable and assimilable preparation are being made.

The analysis of the saliva of nearly 1000 persons made by the author established the protective power of the sulfocyanates in the saliva beyond doubt. The application of sodium sulfocyanid proved to be very successful in chronic throat inflammation, in difficult deglutition, as frequently noted after difficult extraction of lower third molars, in pains or inflammation after the extraction of teeth affected with pericementitis, in the destruction of bacteria in plaques, and in the liquefaction of viscous saliva. In deciduous teeth carious beyond any hope of repair, especially in very nervous children, this drug prevents further decay and allays pain. In pregnancy it relieves the sensitivity of the teeth and acts as a prophylactic. In decalcification of sensitive teeth, exposed cervices, and hypersensitive dentin it also renders excellent service. The presence of sulfocyanates in the saliva also keeps the mucous membranes under bridges and the papillæ in healthy condition, so that in inflammations, infections, and lacerations of the gingival tissues the removal of bridge work is rendered unnecessary by sodium sulfocyanid medication. The secondary effects of the drug are also very favorable in neuralgia, rheumatism, kidney disease, etc. Disturbances in the nervous system, the blood circulation, and the digestive system, which are so often noted in connection with diseases of the gingivæ, the pericementum, and the alveoli, are favorably influenced, also occupational oral diseases due to metal, mercury, or phosphorus poisoning, inspiration of flour or sugar dust, etc.

Lohmann observed that in diseases of the thyroid gland, also in almost all cases of ulcerative stomatitis, no sulfocyanates were present in the saliva. The tests for sulfocyanates in the saliva is made with a dilute

solution of ferric chlorid. Red coloring indicates the presence of sulfocyanates. If the reaction is alkaline, the saliva specimen is acidified with a few drops of dilute hydrochloric acid.

[*Le Monde Dentaire*, Paris, August 1910.]

NOVOCAIN AND ITS APPLICATIONS IN DENTISTRY. By Dr. E. Janicot.

[*La Stomatologia*, Milan, June 1910.]

NOVOCAIN AS A LOCAL ANESTHETIC IN DENTAL PRACTICE. By Dr. E. Bonsaglio.

[*Rivista Trimestrale di Odontojatria e Protesi Dentaria*, Milan, July 1910.]

SOME NEW LOCAL ANESTHETICS, REPLACING COCAIN: A CRITICAL REVIEW. By Professor Dr. G. Fasoli.

Janicot gives a lengthy review of the history of novocain, its physiologic action in combination with adrenalin, its application in dentistry in anesthesia of the pericemental membranes, dentin, and pulp, his review containing nothing essentially new. In confirmation of the articles on this anesthetic that appeared in Dental Cosmos, August 1908, pp. 821 to 827, and September 1908, pp. 926 to 934, the author states that the golden mean between over-enthusiasm and over-skepticism for novocain has now been reached, and that novocain, in combination with one of the derivatives of adrenalin, has a special anesthetic action on sensitive pulps and dentin. Though it does not constitute an infallible medicament nor a universal process of anesthesia of the pulp and the dentin, in the overwhelming majority of cases it comes nearest to the ideal, and with the growing perfection of the operative technique the percentage of failures, which already is extremely small, will be reduced to a minimum.

Dr. Bonsaglio also reports very favorably his experiences with novocain, summing up as follows: The anesthetic power of novocain is equal to that of cocain. It is seven times less toxic than the latter, and three times less toxic than its derivatives. The duration of its anesthetic effect is much longer. The solution can be sterilized either in the autoclave or by ebullition without altering its efficiency. It is neutral, therefore does not injure the tissues. If mixed with a small quantity of suprarenin its anesthetic power is superior to that of cocain or any of its derivatives or substitutes. It can be administered in larger doses than cocain without toxic symptoms. It has no untoward effects upon the heart or respiration, and is therefore indicated in aged and debilitated persons and in children.

A similar verdict in favor of novocain as a local anesthetic is given by Prof. Dr. Fasoli, editor of the recently founded Italian journal *Rivista Trimestrale di Odontojatria*.

[*Revue Trimestrielle Belge de Stomatologie*, Antwerp, June 1910.]

ACONITIN IN FACIAL NEURALGIA. By Dr. H. Versluysen.

Dr. Versluysen makes a strong plea for the prescription of aconitin in facial neuralgia. On account of the difficulties in obtaining this drug in uniform and definite character, it has been tabooed for a long time. Now, since the preparation of aconitin has become absolutely reliable, it can be very advantageously employed in neuralgias of the fifth pair (trigeminal neuralgias), especially when all other anti-neuralgics, such as morphin, quinin, antipyrin, pyramidon, phenacetin, etc., fail. Aconitin is administered in doses of one-tenth, or better one-twentieth, of a milligram, to be taken every two or three hours until the desired effect is obtained—one milligram within twenty-four hours never to be exceeded. In facial and secondary neuralgias aconitin acts as a specific in allaying the pain; at the same time the removal of the causative factor must not be overlooked. During the dosing, the patient must be watched for dryness of the mouth, tickling sensation in the extremities—a very characteristic phenomenon—and paresthesia of the lips and tongue, these symptoms indicating diminution in dosage or extension of the intervals of administration.

[*La Revue de Stomatologie*, Paris, May 1910.]

METHOD FOR THE EXACT RETENTION OF ARSENOUS DRESSINGS WITHOUT PRESSURE. By Dr. P. Fargin-Fayolle.

Numerous methods have been suggested for securely retaining arsenous dressings for devitalization of the pulp, especially in approximo-occlusal cavities in bicuspids. Johnson recommends covering the interproximal space with gutta-percha, starting from the

exposure and extending it to the neighboring tooth. This prevents the dressing from being dislodged toward the gingivæ, but not toward the lingual side. Various matrices and small clamp bands have also been recommended by Brophy and others. For cavities in which it is difficult to securely retain an arsenous dressing, as in disto-occlusal cavities of upper and lower second bicuspids, the author recommends the following method: An instrument with round end and proper curvature—certain curved pluggers will be found very suitable—is held over the orifice of the pulp exposure where the arsenous dressing is to be deposited, the point of the instrument, of course, to be larger than the orifice of the exposure so that no pressure whatever is being brought to bear upon the pulp, and the instrument can be held firmly against the dentinal walls. The jaw and lip are held away by cotton rolls, and, while the instrument mentioned is being held in the left hand, the interproximal space and the cavity are firmly packed with white gutta-percha. After the gutta-percha has hardened, the instrument which has protected the orifice of the pulp-exposure is withdrawn. In order to prevent the gutta-percha from adhering, the instrument is slightly greased with vaselin. We then have a gutta-percha filling with a small cylindrical opening, at the bottom of which lies the pulp exposure. If the instrument should be displaced during the filling with gutta-percha, the pain upon pressure will immediately notify the operator. Before inserting the arsenous dressing it is easy to ascertain the patency of the orifice to the exposure with a fine sound. The arsenous dressing, if inserted by this method, cannot but be accurate. The cylindrical opening in the white gutta-percha is filled without pressure, preferably with rose-colored gutta-percha, so that if any necessity for a second dressing should arise, the rose-colored plug of gutta-percha can be easily removed, and the dressing renewed.

By this method the action of the arsenous acid is localized to the intended spot, and no pressure whatever is brought to bear upon it, insuring a maximum of safety.

PERISCOPE

A Cheap and Efficient Dentifrice.—Table salt, reduced to fine powder, is one of the best dentifrices. It keeps the teeth white, hardens the gums and gives them a rose color, and refreshes the breath.—*Le Laboratoire et le Progrès Dentaire.*

Hemorrhage After Extirpation of the Pulp.—In hemorrhage after extirpation of the pulp pyrozone should never be used, especially not in anterior teeth, as it may cause discoloration. Alcohol and a little patience do better service.—*Tijdschrift voor Tandheelkunde,* per *Deutsche Zahnaerztliche Zeitung.*

Antiseptic Value of Soaps.—Soap may be classed with the familiar antiseptics, its microbicidal action having been proved beyond doubt by numerous experiments. Its action is neither toxic nor irritant, and is not impaired by fatty substances, which on the contrary it removes, thus preparing the tissues for the influence of other drugs. Soap generally should not be mixed with other antiseptics, especially not with sublimate, as it counteracts its effects. Formol, however, can be advantageously incorporated into soap. Soap must be sterilized with steam, as its surface is sometimes contaminated with infectious elements.—Lucas Championnière, *Journ. de Médicine et de Chirurgie Pratique,* per *Revue de Stomatologie.*

Cast Inlays with Pins.—The crowns of carious molars are often so far gone that very little retention can be obtained for a gold inlay. In such cases the canals and pulp-chamber may be filled with gutta-percha, and two straight-headed platinum pins introduced for a little distance into the canals, in such a way that they can be removed together with the wax model. In casting, it is to be remembered that the investment must be heated to a very high temperature, else the cast gold will not hold the pins tightly. —H. Leger-Dorez, *Le Laboratoire et le Progrès Dentaire.*

Painting Smokers' Artificial Teeth.—To obtain good shades for smokers' artificial teeth, a solution of potassium permanganate is painted on the teeth, which are first ground slightly. The darker the shade desired, the stronger a solution is to be employed. The teeth are baked in the furnace at from 950 to 1000° C.—Escudier, *Le Laboratoire et le Progrès Dentaire.*

Retention of Porcelain Inlays.—In order to insure an absolutely secure retention of porcelain inlays, the cavity must be absolutely dry. It is recommended before inserting the setting cement to wet the cavity with the cement liquid or simply phosphoric acid. The cavity surface of the inlay should be roughened.—L. De La Barra Lastarria, *Revista Dental de Chile.*

Dangers of Potassium Cyanid.—Potassium cyanid is often employed for removing silver nitrate stains from the skin. If any particle thereof is left under the finger-nail, or if the skin is ruptured, though invisibly to the naked eye, grave toxic symptoms, even gangrene may set in, which is liable to necessitate the amputation of the finger.—*Revue Internationale de Prothèse Dentaire.*

How to Make Tight Wire Ligatures.—In tying wire ligatures, the fingers should be as close as possible to the knot. If in pulling the two wire ends the fingers are held too far away from the knot, the ligature becomes loose. Strong pulling of the wire ends is of no avail, as the material used is rigid. If a ligature after final twisting is found to be loose, it should be renewed.—*Zeitschrift fuer Zahnaerztliche Orthopaedie.*

Hand Instruments in Cavity Preparation for Inlays.—In preparing cavities for inlays, I strongly advocate the more extensive use of hand instruments. With enamel chisels and excavators a good operator should be able to almost finish the cavity without resorting to the engine, and then only to use it for trimming and shaping the cavity. Stones, such as Butler's and Millar's points, are very useful for obtaining a fine finish of the cavity walls.—T. W. Davie, *Dental Record.*

Simple Method of Repairing a Broken Logan Crown.—If a Logan crown is broken from faulty articulation or some other cause, and the pivot remains in the root, instead of reaming out the pivot, which is a very tedious operation, a suitable S. S. White detachable crown is selected, and with a No. 10 S. S. White diamond drill the socket in the crown is enlarged to fit the Logan pivot, whereupon the new crown is adapted to the root and cemented to place.—*Bulletin du Syndicat des Chirurgiens-Dentistes.*

How to Prevent Rust.—In order to protect iron or steel objects against rust, dissolve two parts of crystallized iron chlorid, two parts antimony chlorid, and one part of tannic acid in four parts of water; coat the objects, using a sponge, and allow them to dry. The solution is applied twice, or, if necessary, three times. After drying, the objects are rinsed in water, allowed to dry once more, and then polished with boiled linseed oil. This solution is specially applicable to the shell of a vulcanizer.—*Zeitschrift fuer Zahntechnik.*

Arsenous Acid versus Arsenic Acid in Devitalizing the Pulp.—If a pulp is to be devitalized with arsenic, no hydrogen dioxid should be introduced into the carious cavity before applying the dressing, as the arsenous acid oxidizes and becomes arsenic acid, which is much more caustic and toxic and diffuses much more readily. Moreover, arsenic acid is easily soluble in water, whereby its effect is still more intensified, while arsenous acid is soluble in water only in the proportion of 1:100 and consequently acts less vigorously.—Touvet-Fanton, *L'Odontologie.*

To Prevent Excessive Brilliancy in Porcelain Inlays.—The excessive brilliancy of a porcelain inlay may be reduced by hydrofluoric acid, in the use of which great caution is necessary. A simpler method consists in building up the lowest layer in the matrix before baking, with a mixture of one part of cement powder and three parts of porcelain. The cement particles in this bottom layer, moreover, enter into a firm combination with the setting cement, insuring very solid retention.—L. De La Barra Lastarria. *Revista Dental de Chile.*

How to Cement Bands, Especially in Retention Appliances.—Retention appliances, consisting of two or more bands, are difficult to cement in the mouth, as the cement frequently hardens before the bands are sufficiently tightened. If the appliance consists, for instance, of two molar bands joined by a soldered inner-arch bar, the molars are first cleansed with hydrogen dioxid, then with alcohol, and the retention appliance is put in place. One side of the mouth is then desiccated, and the cement mixed to a creamy consistence. The band on the dry side is

then lifted off the molar, when the other band will remain perfectly in its place without being distorted, or without the bar being bent. The inner side of the band and the tooth are then coated with the cement, and the band is placed in its correct position and screwed up tightly. The band on the other side is fixed in the same manner, no great haste being required, so that all necessary attention can be devoted to the necessary definite position of the retention appliance.—*Zeitschrift fuer Zahnaerztliche Orthopaedie.*

Oral Hygiene and Tuberculosis.—Tuberculous infection from the teeth is possible if the pulp is degenerated so that the contents of the root-canal can reach the glands through the bone. The tuberculous toxin, which is contained in the coating on the teeth, can also get into the blood by way of the soft tissues if any lesions of the mucosa are present. Bacteria can also be absorbed by the tonsils, resorbed by the mucous glands, or during deglutition pressed into the mucous membrane and the lymphoid organs.—Prof. Moeller, *Muenchner Medizinische Wochenschrift*, per *Deutsche Monatsschrift fuer Zahnheilkunde.*

To Avoid Irritation from Tincture of Iodin.—The irritation from tincture of iodin when used as a disinfectant can be avoided by the addition of chloroform—iodin 1.0, chloroform 20.0. If preserved in a well-closed vessel this solution keeps indefinitely. In order to disinfect the skin it is first rubbed perfectly dry with a wad of cotton, then painted with the iodo-chloroform. After the operation the iodin can be removed by wiping with a cotton wad saturated with chloroform. Even if this it not done, the iodo-chloroform quickly evaporates. The skin remains supple and the epidermis intact without chapping. —*Zeitschrift fuer Zahnheilkunde.*

For Treatment of Gingivitis in Pregnant Women.—The free borders of the inflamed gingivæ are slightly painted with a small tampon of cotton saturated with the following solution:

Chloral hydrate,	10	gram.
Spirit of cochlearia,	10	"

Or three pills, one to be taken in the morning, one at noon, one in the evening, are prescribed, of the following composition:

Extract of valerian,		
Valerianate of ammonia,	āā 0.05	gram.

—Pinard, *Le Monde Dentaire.*

Refitting Upper Plates.—If for any reason it is impossible to make a new upper plate when the old one has become loose from resorption of the alveolar process, the plate can be refitted in the following way: The whole palatal and alveolar inner side of the plate is roughened with a bur, and enough gutta-percha to make the plate fit is built up, the plate pressed firmly to place, and the patient asked to bite in order to secure proper articulation. After the gutta-percha has hardened under a cold-water jet, the plate is removed, a suction chamber cut out at the proper place, the plate invested, the gutta-percha replaced with rubber, and the plate vulcanized in the usual manner.—L. De La Barra Lastarria, *Revista Dental de Chile.*

Number of Visits Necessary in Orthodontia Treatment.—The frequency of visits needed in orthodontia treatment is perplexing to many. As a rule, dentists require too many visits in these cases. Twice a week is usually often enough to keep everything at its very best. Once a week is hardly enough, unless the patient is quite intelligent and much in earnest. Three visits a week are very seldom needed, and once a day, as occasionally followed, is a waste of time for both patient and operator. Too frequent visits where little is done—and sometimes nothing—give the impression that orthodontia is a trivial thing, and a substantial fee is hard to collect. It also promotes the idea that a case lasts forever, and scares away new patients.—Wm. J. Brady, *Western Dental Journal.*

For Treatment of Fetid Breath.—Have the patient rinse his mouth several times during the day with a glassful of water, to which a dessertspoonful of the following mixture has been added:

Sodium bicarbonate,		
Saccharin,		
Salicylic acid,	āā 5.50	gram.
Alcohol,	200	"

Frequent rinsing, especially after meals, with water to which a teaspoonful of the following solution has been added, is also recommended:

Crystallized carbolic acid,		
Salicylic acid,	āā 2.50	gram.
Sodium borate,	5	"
Menthol,	3	"
Essence of thyme,	2	"
Tincture of aniseed,	10	"
Alcohol (90 per cent.),	125	"

—*Revue Internat. de Prothèse Dentaire.*

Matrix Formation for Simple Approximal Cavities.—In the construction of matrices for simple approximal cavities, there are two or three points to consider. First, it is essential that the teeth be properly wedged to permit of proper withdrawal of the matrix; and second, the foil should be forced to the walls of the cavity before it is turned over the margins. It should be worked into the cavity with cotton and burnishers first, then forced to the walls of the cavity with hard wax and tape. In many cases where the cavity extends well to the gum margin, the foil should be doubled on itself, then forced into position so as to have a surplus of foil which can be tucked under the gum margin.—J. Q. Byram, *Pacific Dental Gazette.*

An Improved Chip-blower.—The chip-blower, though very useful, is one of the most unhygienic instruments, as it is impossible to sterilize it, and even when it is most dexterously handled, saliva, with all the bacteria contained in it, is sucked in and blown out again into a cavity or on the mucous tissues. This may be prevented if two valves, one in front and one back of the bulb are applied, the front valve to prevent the indrawing of air through the nozzle, the rear valve to prevent the escape of air backward. By this arrangement the cavity can be blown out without saliva being drawn into the blower. Moreover, no clogging up of the nozzle can occur, and after pressing, the bulb returns to its normal form much more readily.—Mischke, *Ash's Wiener Vierteljahrs-Fachblatt.*

Separation Preliminary to Applying Clamp Bands in Orthodontia.—Preliminary separation will seldom be found necessary in applying bands; by seesawing back and forth the bands themselves act as separators, and usually make all the space needed with little or no trouble. Sawing or grinding between the teeth to make space for regulating bands, as occasionally advocated, is both unnecessary and reprehensible; in fact it is downright malpractice. The bands can seldom be driven to place between the teeth, as they are so thin that they will double up or "buckle." Seesawing with the fingers will usually do the work. When the bands are nearly on, it is advisable to screw up the bolts fairly tightly; this gives the exact shape of the tooth to the bands, after which the bolts are loosened a little, and the bands worked entirely on. They will then slip between the tooth and gum, and in nine cases out of ten cause absolutely no pain in applying. This is one of the excellent features of the contoured bands.

In finally clamping a band tightly to a tooth, care should be used not to overstrain the bolt. Any clamping device is necessarily made as small as possible, and enough force can easily be used to wreck the whole apparatus. This applies to any and all makes of clamp bands. The operator should tighten the clamp bolt until the band is drawn snugly about the tooth, and then stop. There is no need of tightening the bolt until the grip of the fingers can no longer turn it; in some cases the bands will stand this amount of pressure, but often this unnecessary strain will result in breakage.—Wm. J. Brady, *Western Dental Journal.*

Preparation of Cavities Involving the Incisal Edge.—There are two general divisions of approximal incisal cavities, one with and one without a step. As a general proposition, a step should be used with approximal incisal inlays. There are times, however, when the labial and lingual walls are strong, and there is but a small portion of the incisal edge involved, when the cavity may be prepared in such manner that a step is not required. In the preparation of this form of cavity the margin is prepared in a straight line. After the margin has been prepared, a cavity, triangular in form with the base of the triangle at the gingival wall, is cut between the labial and lingual walls. If this cavity can be made deep enough to support the inlay, there is no doubt that the inlay will be retained, but if it cannot, then I advise the use of the step.—J. Q. Byram, *Pacific Dental Gazette.*

The Effects of Chronic Nasal Obstruction during Childhood upon the Growth of the Teeth and Jaws.—Deficient development of a part of the upper jaw is very frequently seen in association with nasal obstruction. It is most marked in the incisor and molar regions. Before the eruption of the permanent teeth, the defective growth may be shown by the absence of proper spacing between the teeth. I have frequently noticed in young children suffering from adenoids that although the deciduous teeth were good and regular, they were so close together as to be in direct contact. After the seventh or eighth year, as the larger permanent teeth begin to grow, crowding and irregularity result. The abnormal occlusion which is not infrequent among oral breathers is, by some authorities, accounted for by this defect in the development of the upper

jaw. Defective growth of the whole of the upper jaw is, in my experience, much less frequent. The few cases I have seen have all been in adults who have suffered from almost complete blocking of the nasal passages for many years.

Some degree of narrowing of the alveolar arch is, I think, so common among mouth-breathers as to be almost a constant feature. The arch, which is normally horse-shoe shape, may, in marked cases, assume the outline of a V or a U. The broadest part of the arch, instead of being between the first molars, is found to be farther back between the second molars, or even the third molars when they are present. Mr. Colyer, in a paper read before the Odontological Society of Great Britain on November 23, 1908, gives actual measurements which he had taken of a large number of cases to show the amount of narrowing of the arch in cases of nasal obstruction. He found that the average normal breadth between the first molars was 34.59 mm., whereas in cases in which there were postnasal adenoids, but not presenting an open bite or upper protrusion, the average was 33.19 mm., a reduction of 1.39 mm. In cases where an open bite was present the reduction in breadth was much greater, being 4 mm.—J. S. Barr, *British Dental Journal.*

Melting and Casting Aluminum by the Bucket Method.—The pure aluminum should be in ingot form and not in sheet form. The ingot should be large enough to more than fill the mold, but not large enough to fill the crucible. The flame used upon the aluminum should have a yellow color, showing that the flame has an excess of free carbon and not of oxygen as shown by the blue flame. The molten metal should be carried (an estimated one hundred degrees) beyond its fusing-point, when, without hurrying, a perfect cast may be made. When the metal is thoroughly melted, the flame is turned off, the bail slipped into place, the chain straightened, and the bucket lifted off the stove. The operator must stand where there is no obstruction to the free swinging of the bucket. There should be no jerk at the start of the swing, but a steady long swing. Speed may be increased as desired, but great speed is not necessary. The bucket should be swung in a perpendicular plane, not horizontally. The motion should be kept up until the metal has crystallized, after which further condensation cannot be induced. The flask should stand ten minutes, when it may be placed in a pan of water and cooled as rapidly as desired.—G. H. Wilson, *Dental Summary.*

Shade Guide to Enamel Inlay Work.—It is especially the beginner who often experiences the disagreeable surprise of finding that the successful inlay, after it has been placed in the tooth, proves to be of a different shade, owing to the cement used and the refraction of the inlay having altered the color.

I myself prepare the shade guide, separately, from each portion of the porcelain body, from which I myself make the inlay, in the same furnace, in the same light, and if possible at the same time of day, with the same tools. I believe that it is important to choose the same moment of the day, not only because of the light, but also because, *cæteris paribus,* my eyes are then just as fresh or just as tired. When the porcelain body is all used, I make new patterns from the new body.

For the corners I make special patterns, and also for the inlays which go in the central cavities and which, according to their employment, are surrounded by the fixing cement and by the tooth. For a corner the pattern is like the edge of a central incisor; it is about as thick and about as wide. I place this porcelain pattern piece on a handle, so that I can hold it beside the tooth and compare the color well with the color of the tooth. In order to come at the tooth better, I grind the edge rather concave.

In this way the color can be matched with a fair amount of accuracy, so long as I keep before my eyes the indispensable necessity of bringing the pattern piece of porcelain as nearly as possible into the same condition as the tooth; so I dry it first, and dampen it then with water, and the shade guide also, and hold the latter against the sunlight at the same angle as the tooth. It would be better to moisten both the tooth and the shade guide with the patient's saliva; but this is not to be done, for it would be an offense against the laws of hygiene to allow the piece of porcelain to come more frequently into contact with the saliva of different people than is absolutely necessary. It would also be disagreeable and disgusting to the patient to see eight or ten pieces of porcelain successively wetted with his saliva.

I endeavor to place the porcelain pattern of the central cavity as nearly as possible in the same position as the inlay will occupy in the tooth; *i.e.* I put the pattern piece into an extracted tooth, taking great care that the color of the former matches that of the latter, and placing it as the tooth which is to carry the inlay will be. The cement that I employ to fix the pattern piece

is the same that I use for placing the inlay, thus the porcelain is not only in a similar tooth, but in a similar cement foundation. Thus the pattern is nothing but a regularly made and applied porcelain inlay in an extracted tooth. When that is done, I grind away from the pattern tooth enough to let the porcelain come to the open space, which renders it possible to hold it quite close to the patient's tooth. Thus the shade guide may be inspected exactly as if it were an inlay in the tooth which is to be preserved, and it is very perceptible whether the color matches or not.—Alexander Banyai, *Garretsonian.*

A Method of Treating Superficial Softening and Erosion at the Junction of the Enamel and Cementum.—These cases have been a profound puzzle to many conscientious dentists and a source of mortification on both sides, causing chagrin at our helplessness and disgust with our attempts and failures. These softenings are usually found upon the labial and buccal surfaces of the incisors, canines, and bicuspids, and it has been the experience of the writer to meet with more cases in the upper than in the lower teeth. There is usually much discoloration, running through a variety of shades, from almost black through yellows and browns to very slight modifications of the normal color of the teeth. In some cases there is little apparent loss of tissue, but discoloration, as recognized by the eye, and softening, as apparent to the touch of the explorer.

Some cases simulate erosion, for, commencing as a softening by decalcification the affected tissue is removed—probably by the brush—frequently leaving a sharply defined edge of enamel so square as to be easily recognized by the patient in drawing his fingernail over the necks of his teeth.

Some years ago, discouraged with numerous failures in such cases, I resolved that whenever presenting in season, especially in the mouths of persons past the meridian of life (thirty-five), if not too deeply softened, I would try the plan of grinding the tooth to a level, re-shaping it, as it were, so as to leave it hard, smooth, and easy to keep clean. My success with a few of these cases under this re-shaping treatment has been so gratifying that I have practiced it more and more, and feel that I can conscientiously present it to those of my profession who will use it with thoroughness and discretion.

For this grinding I use small gem stones, oval and bud forms, being careful to remove all softened tissue, regardless of whether it is enamel or cementum, and also to remove enough of the healthy enamel from the labial surface to restore that surface to a plane pleasing for the eye to view, and to slope so perfectly as to leave no points of lodgment for fermenting food substances. These ground surfaces should be highly polished with fine cuttlefish disks and moose-hide cones. This treatment is more applicable to those teeth presenting a double-convex surface labially, such as the canines and upper central incisors, but it may be used on lateral incisors, bicuspids, and molars, if the cases are carefully selected. In bicuspids the grinding must be done with small round-edged wheels or cones, so as to leave the enamel with a gradual slope.—L. G. Noel, *Dental Brief.*

Soldering Aluminum.—For soldering fine parts of aluminum, the following solder may be employed: Aluminum 10 parts melted slowly without overheating, silver solder 30 parts, tin 30 parts, and bismuth 30 parts. A cheaper solder may be obtained by melting the following ingredients in the order mentioned: Copper 3 parts by weight, aluminum 6 parts, zinc 26 parts, tin 60 parts, cadmium 5 parts. For deoxidization a pinch of zinc chlorid and some tallow are added. It is very important to brightly polish the portions to be soldered, and to sufficiently heat the aluminum, as it requires a great deal of heat. The solder, however, must not be exposed too much to the flame, and no acid or borax must be employed. A soldering copper, even though it be new and bright, is not as good as a chisel-shaped, bright, and flat staff of iron, which does not oxidize and does not form an alloy. The gas blowpipe, too, has a deoxidizing effect. The great tendency of aluminum to form oxids on its surface frequently brings it about that apparently well-soldered pieces, which have even stood the blows of a hammer, fall apart after some time.

L'Electricien mentions a flux recommended by U. Schoop, which, by removing the layer of oxid always present on the surface of aluminum, permits of uniting two pieces of aluminum by an oxyhydrogen or acetylene-oxygen blowpipe. The flux consists of 60 parts of potassium chlorid, 12 parts of sodium chlorid, 4 parts of potassium bisulfate, and 20 parts of lithium chlorid. This mixture is melted in a platinum crucible, then pounded in a mortar and mixed with water to form a thin paste. In order to reduce the melting-point of the mixture, in case the above-mentioned blowpipe flames are used, the quantity of potassium bisulfate must be increased. This flux not only removes the layer of oxid but

also prevents the access of the surrounding air to the heated metal surfaces. Its melting-point lies slightly below that of aluminum. As the flux does not penetrate between the surfaces to be united, but must be painted directly on them, a real autogenous union takes place, the aluminum melting soon after the flux.—*Zeitschrift fuer Zahnheilkunde.*

OBITUARY.

DR. BASIL MANLY WILKERSON.

Died, at Harrisonburg, Va., June 13, 1910, Basil Manly Wilkerson, D.D.S., M.D., in his sixty-ninth year, of paralysis of the heart.

In the demise of Dr. Wilkerson the dental profession loses one of its most meritorious members and one of its most ingenious inventors. Dr. Wilkerson was born in Tuscaloosa county, Ala. (Foster's Settlement), on March 28, 1842. His father was Presley Hawley Wilkerson of Kentucky, his mother Eliza (Foster) Wilkerson of Georgia. The deceased fought with valor in the civil war, being enlisted in company K, 8th Alabama regiment of volunteers, from 1863 to 1865. After his honorable discharge he attended the Baltimore College of Dental Surgery, from which he was graduated with honors in 1868. In 1873 he received the degree of M.D. from the College of Physicians and Surgeons of Baltimore. He was a member of the faculty of the Baltimore College of Dental Surgery from 1872 to 1879, and clinical instructor in the University of Maryland from 1883 to 1888, his rich stores of knowledge earning for him the admiration of his students and the praise of his profession. His wonderful efficiency in his chosen profession was further evinced by his notable activity as founder and editor of the *Independent Practitioner*, which under his able guidance flourished from 1879 to 1883.

Dr. Wilkerson's name became known to dentists all the world over by his invention of the Wilkerson chairs and by other valuable inventions in the dental field. From 1872 to 1888 the deceased conducted a very successful dental practice at Baltimore.

All the work undertaken by the deceased, however arduous the task, bore the stamp of his individuality and the mark of his inventive genius. All his work was done without ostentation, but when the results came to light they always constituted a wonderful surprise to his grateful fellow workers, who will ever cherish his memory. Dr. Wilkerson was a kind friend, gentle and charitable, commanding that reverence and respect that the world must bestow upon a man endowed with genius and guided in all his undertakings, small or great, by the noble spirit of the gentleman.

Dr. Wilkerson was a member of the Photographic Club of Baltimore, which in his demise loses one of its most enthusiastic members. He was a member of the Baptist Church.

DR. JOHN B. RICH.

Died, at the Home for Old Men and Aged Couples, New York, N. Y., Friday, August 12, 1910, Dr. John B. Rich, in his one-hundredth year.

In the demise of Dr. John B. Rich a life full of manly vigor, healthy activity, and no little romance and adventure has come to a termination. Dr. Rich was born in New York in 1811, yet owing to his wonderful health this centenarian retained his mental prowess to the end. In his early days he was known as the strongest man in the world. He was also noted for his remarkable memory. He never used alcohol or tobacco, and attributed his long and healthful life to the fact that he never put anything into his stomach that it could not digest with ease.

Dr. Rich's father was a man of independent means and a scholar. When the boy was one year old, the father was killed in the war. As a boy he ran away to Philadelphia, shipped as a cabin boy to see Africa, jumped overboard at Funchal, Madeira, because he was ill-

treated, was rescued by a French ship and adopted by a Parisian diplomat who happened to be on board. He was educated at the military academy of St. Cyr, where his superb manhood and marvelous physical development excited general admiration. After being graduated in medicine, Dr. Rich obtained an English passport and traveled extensively. In Naples he was seized by the authorities for knocking down a man who had rudely buffeted him and who turned out to be the Duke of Padua, brother to the King of Italy. Dr. Rich was finally released, but not until a British frigate had threatened to bombard the town. After that he entered the service of Mohammed Ali Pasha, then Khedive of Egypt, and as an officer in the Pasha's forces partook in the naval expedition dispatched to take Constantinople in 1834. While in Egypt, Dr. Rich met and married the daughter of the English ambassador to Egypt. After his return to New York, Dr. Rich first engaged in newspaper work. He used to say that he helped to take the first photograph ever produced in that city, after the explicit instructions written by L. J. M. Daguerre's own hand.

In 1836 he began the practice of dentistry in New York, and in the same year founded the organization from which grew the American Dental Association. After several years of practice he made numerous trips abroad, where he studied and engaged in dentistry in France, Belgium, and Germany, and obtained diplomas for advanced work. He continued his practice until 1908, when he retired in order to devote his time to teaching people how to retain perfect health and good spirits in old age. He was the founder of the first gymnasium for women ever conducted in New York. Besides preaching and practicing moderation in the matter of diet, Dr. Rich advocated proper physical exercise. One of his rules for longevity is of special interest for dentists: "Every muscle in the human body must be brought into action and put to the use for which it is intended, if it is to be kept in good condition. No man can allow a single part of his body to remain long in inactivity without paying the penalty for it. Any muscle in disuse will deteriorate and become the seat of infirmity or disease. As no man probably has an occupation which properly exercises every muscle of his body, everyone should take scientific exercise at least once a day, to bring into action the muscles not otherwise used."

Dr. Rich was president of the American Microscopical Society, of the Bailey Microscopical Society, of the Hundred Years' Club, of the Physical Culture Club, and the Epicurean Club. He was a tenor singer, a contributor to magazines and newspapers, and a writer on dramatic, musical, and dental subjects. In recent years he had been at work on medical books. In him humanity loses one of its most perfect specimens in both mental and physical respects, and the dental profession one of its foremost members.

Dr. Rich leaves a son of seventy-six, who lives in England.

DR. WILLIAM JUDSON NEWTON.

DIED, at his home, 525 South Poplar st., Ottowa, Kans., July 27, 1910, Dr. W. J. NEWTON, in his sixty-first year, after a week's illness.

The oldest dentist in Kansas City, who enjoyed an excellent practice up to the time when he was first taken ill, has passed away. Dr. W. J. Newton was born in Cuba, Ill., on February 9, 1850. He came from a family of dentists, both his grandfather and father being engaged in the practice of dentistry. Dr. Newton learned the first principles of his profession in the office of his father, who had resigned from the ministry in order to take up dentistry because none of the dentists within his reach could fit him with a perfect dental plate. The deceased never attended a dental college, learning his dentistry by home study; his practical talent, however, was well cultivated, and he became one of the most successful practitioners, during the past few years confining his energies to plate work. Dr. Newton went to Ottowa from Ohio in 1872, and set up a practice, always having young scholars in his office, who afterward became noted men in the profession. He was actively engaged in the work of the county horticultural society, and at one time its president. He was known as an active prohibition worker and held several offices in the state organization. He was also actively connected with the work of the First Baptist Church. The deceased acted as official government forecaster for his section for

the past fifteen years. His records were the most complete and reliable that have ever been kept. There was no man better known in Ottowa, no one who made and kept friends more readily, and no one more noted for his scientific and practical achievements.

Dr. Newton was married to Miss Lena Kelsey, who survives him, together with their three children, Mrs. Lillian Ringle of Cherryvale, Miss Eva Newton of Ottowa, and Mrs. Ora Conklin of Osawatomie. Interment was made in Hope Cemetery.

DR. EDWARD BENJAMIN IBBOTSON.

Died, at his home, in Montreal, Que., on June 16, 1910, Lieut.-col. E. B. Ibbotson, D.D.S., in his fifty-sixth year, of arterial sclerosis.

After a thirty years' practice of dentistry, during which time he had devoted himself untiringly to his work, and was recognized as one of the leaders in his profession in Canada, Dr. E. B. Ibbotson has passed away.

He was born in Montreal in 1855, and received his early education at the McGill Normal School. He studied dentistry at Bishop's College, from which institution he received the degree of D.D.S. in 1880. He practiced his profession in Montreal, meeting with considerable success. In 1893 he was appointed a member of the dental board of examiners, and for two years was treasurer of that body. In 1895 he was appointed president and held that office until he resigned in 1898. For several years the deceased was dental surgeon at the Montreal General Hospital, also at the Royal Victoria Hospital. He was also president of the Odontological Society during 1900 and 1901.

Dr. Ibbotson took a great interest in military work, achieving great distinction therein as a most efficient officer. He worked his way from the ranks to the command of a brigade, before he joined the reserve officers a few years ago. On his retirement as lieutenant-colonel of the Royal Scots he was appointed to the command of the 18th Infantry Brigade, which he held until 1909, when he retired from active militia work with the rank of lieutenant-colonel. Dr. Ibbotson was also keenly interested in rifle shooting, and was president of the Amalgamated Rifle Association from 1893 to 1896, vice-president of the Montreal Rifle Association from 1894 to 1896, commander of the Canadian Bisley team in 1894, and president of the Montreal Military Institute in 1895. For many years he was also vice-president and a member of the council of the Dominion Rifle Association.

The deceased was a member of the St. James, Canada, Chapleau, and Mattawa Fishing and Hunting Clubs. He was also for many years an active member of the congregation of the Church of St. James the Apostle.

Dr. Ibbotson is mourned by many people in professional, social, and military circles, who by his demise are bereaved of a valued friend, *confrère*, fellow citizen, and comrade.

In 1887 Dr. Ibbotson was married to Fanny Louisa, daughter of the late M. H. Gault, M.P., who with eight children survives him.

Interment was made with military honors, the escort being furnished by the 5th Royal Highlanders, which regiment Lieut.-col. Ibbotson commanded for some years.

Brief Necrology.

Dr. L. L. Lusk of Chicago, Ill., June 19, 1910, of drowning.

Dr. William F. Michaelis of Englewood, Ill., August 5, 1910, of a gunshot wound.

Dr. M. A. Banks of Rockford, Ill., August 8, 1910, in his fortieth year, in a train wreck.

Dr. Barney A. Mosbey of Huntingburg, Ind., August 24, 1910, in his forty-fifth year, of toxemia.

Dr. Frederick A. Strayer of Waterloo, Ia., August 30, 1910, in his forty-ninth year, of tuberculosis.

Dr. A. A. Sullivan of Oswego, N. Y., August 29, 1910, in his fifty-eighth year, of Bright's disease.

Dr. Walter C. Dyer of Chicago, Ill., July 30, 1910, in his sixty-seventh year, after a prolonged illness.

Dr. James H. Bean of Youngstown, Ohio, August 21, 1910, in his forty-second year, of uremic poisoning.

Dr. Ernest F. Carter of Medford, Mass., April 21, 1910, in his forty-fourth year, after a surgical operation.

Dr. C. R. Keirstead of Indianapolis, Ind., July 17, 1910, in his twenty-eighth year, of cancer of the stomach.

Dr. A. C. Deputy of Indianapolis, Ind., April 21, 1910, in his sixty-fourth year. Deceased was a veteran of the civil war.

Dr. A. D. Saunders of Ithaca, Mich., July 20, 1910, in his thirty-first year. Deceased was a graduate of the Dental Department of the University of Michigan.

Dr. Erskine H. Dickey of Brooklyn, N. Y., July 18, 1910, in his seventieth year. Deceased was a veteran of the civil war, and a one-time member of the Brooklyn Board of Education.

Corrigendum.

Our notice of the demise of Dr. Albert H. Babcock of Brooklyn, N. Y., published in our September issue, page 1050, we are glad to learn was an error.

SOCIETY NOTES AND ANNOUNCEMENTS.

NORTHERN INDIANA DENTAL SOCIETY.

The twenty-second annual meeting of the Northern Indiana Dental Society will be held at South Bend, Monday and Tuesday, October 17 and 18, 1910.

Clem Shidler, *Sec'y*,
South Bend, Ind.

XI PSI PHI FRATERNITY.

New York Alumni Association.

The annual fall meeting and election of officers of the New York Alumni Association, Xi Psi Phi Fraternity, will be held at Healy's, Columbus ave. and 66th st., New York city, at 8 p.m., Wednesday, October 12, 1910. Every Xi Psi Phi aluminus residing in or about New York city is urged and expected to be present.

J. N. Gelson, *Sec'y*,
Brooklyn, N. Y.

SOUTHERN ILLINOIS DENTAL SOCIETY.

The Southern Illinois Dental Society is preparing to celebrate its twenty-fifth anniversary at Chester, Ill., October 25 and 26, 1910.

The Executive Committee are now at work on the program, and have promised to have the best in the history of the society. All members of the dental profession in Southern Illinois and all members in the surrounding territory are requested to remember the date, and so arrange that they may be in attendance. The program will be printed in due time, but even at this date we are safe in saying that there will be "something doing" all of the time.

NORTHEASTERN DENTAL ASSOCIATION.

The sixteenth annual meeting of the Northeastern Dental Association will be held in Boston, Mass., at the Hotel Somerset, October 20 to 22, 1910. The essays, clinics, and exhibits promise a meeting well worth attending.

Edgar O. Kinsman, *Sec'y*,
Cambridge, Mass.

NORTHERN ILLINOIS DENTAL SOCIETY.

The twenty-third annual meeting of the Northern Illinois Dental Society will be held on October 19 and 20, 1910, in Aurora. The chairman of the program committee has assured me that he has prepared a "crackin' good" program. Come prepared to assimulate it.

Frederic H. Bowers, *Sec'y*,
Freeport, Ill.

DENTAL INDEX BUREAU

UNDER THE AUSPICES OF THE

NATIONAL ASSOCIATION OF DENTAL PEDAGOGICS.

THE following matter has been issued in the form of a circular justly purporting to be "of special interest to students, writers, publishers, editors, librarians, colleges, dental societies, etc." It is described as—

A PLAN BY WHICH SUBSCRIBERS WILL BE FURNISHED A CLASSIFIED CARD INDEX OF ARTICLES IN THE LEADING DENTAL JOURNALS.

At a meeting of the National Institute of Dental Pedagogics, held in St. Louis last December, a committee was appointed to establish a Dental Index Bureau. Briefly stated, it is intended that this committee shall employ a competent person to review and classify all of the articles in ten or twelve of our leading dental journals, and shall furnish to each of the subscribers to the Bureau, at frequent intervals, cards so classified and grouped that the subscriber may easily and quickly find all the articles on any subject in dentistry. These cards will be made on a definite system, by which additional cards may be added as they are received and always go to their proper places; so that no matter how many additions may be made from year to year, all of the cards on each subject will be in a separate group. For example, all of the articles on the subject of filling teeth with gold will be in one group, all on filling teeth with amalgam in another, all on cavity preparation in another, all on alveolar abscess in another, etc.

It is hardly necessary to mention the value of such an index to the wide-awake members of the profession. Journals which may have accumulated, and which are now almost worthless on account of the difficulty in finding articles when desired, will become of service as the index is extended to cover them. The man who has occasion to look up a particular subject, or to write a paper, can find all that has been written on that subject instantly. The grouping of articles on each subject enables one to bring together the views of many writers. Post-graduate courses of study can be instituted by dental societies or undertaken by individuals; the ready reference index will make college libraries of the greatest value to the faculty and to the student body; editors and writers will find their work facilitated, and the results of their study more gratifying to themselves and more highly appreciated by their readers.

The idea of the committee is to organize a permanent society for the purpose of classifying and indexing all dental literature. The present plan is but preliminary to the greater work, which will cost less and less to individual subscribers as the number of members is increased. Those who help to start the work will profit more than those who follow, and will have the satisfaction of participating in one of the greatest advance movements in dentistry.

The subject-matter of several of the leading dental journals has already been classified and indexed by Dr. Arthur D. Black, at a great expenditure of time and money. This index contains about 40,000 cards, cataloging articles in various journals from 1839 to date; but it is not available, for obvious reasons, to the profession at large. Your committee is privileged to copy these cards, should the funds subscribed permit, which would be of great benefit to the subscribers and incidentally to the whole profession.

It is the committee's intention to this year furnish each subscriber with author and subject cards for all original articles, papers read before societies, book reviews, and editorials, in about ten journals for 1908 and 1909—from 4000 to 5000 cards, all properly arranged with all cards for each subject together, with guide cards for each subject and with author cards arranged alphabetically. It is expected that in 1910 the cards will be furnished for the same journals for the years 1907 and 1910; and in 1911 cards for 1906 and 1911. Thus in three years each subscriber will receive cards for these journals for six years—probably 25,000 to 30,000 cards. These cards will be sent in boxes in which they may be kept permanently. The number of journals indexed and the number of cards sent out by the committee, however, will depend upon the number of subscribers.

The preliminary report of this committee, which was made at the St. Louis meeting, gives an outline of the plan. It will be noticed that it is the intention to try this plan for a period of three pears, and subscriptions at the rate of Twenty-five Dollars ($25.00) a year for that period may be sent to any member of the committee.

Subscriptions will be received from individuals, dental journals, dental schools, or dental societies. Any person or group of persons may send in a single subscription, and one set of cards will be sent in return. Subscription blanks may be had from any member of the committee.

Report of the Committee on Classifying and Indexing Dental Literature, to the Institute of Dental Pedagogics, at the annual meeting, St. Louis, 1908-1909.

The undersigned committee, appointed by the Institute of Dental Pedagogics for the purpose of devising ways and means for classifying and indexing current dental literature, as an evidence of progress presents to the members of the Institute and others interested the following plan:

1. That the subscribers to this plan organize themselves into an association to be known as The Dental Index Bureau.

2. That the above-mentioned committee, appointed by the Institute, will devise ways and means for carrying out the work of the Bureau during the coming year, and will call a meeting at the time and place of the next meeting of the Institute, for the perfecting of a permanent organization.

3. That this committee will employ a competent person to classify as much of the current dental literature as possible, beginning with January 1909 journals, and will furnish subscribers, at frequent intervals, with author and subject cards of all articles classified.

4. That this committee will be guided by a vote of the subscribers in the selection of the literature to be classified.

5. If the funds subscribed will permit, as much as possible of the literature of previous years will be similarly classified and indexed.

W. L. Fickes, *Chairman*,
Arthur D. Black,
Herman Prinz.

NORTH PHILADELPHIA ASSOCIATION OF DENTAL SURGEONS.

The North Philadelphia Association of Dental Surgeons has been recently organized, having as its object the mutual help of its members and the advancement of the profession. Membership is governed by the code of ethics. Its meetings are held monthly. The following officers have been elected for the ensuing year: E. H. Mentzer, president; R. E. Denney, vice-president; Richard Souder, (148 W. Lehigh ave.), secretary; W. C. T. Bauerle, treasurer; Howard H. Shepler, editor.

Howard H. Shepler.

ROTTERDAM DENTAL SOCIETY.

Gnatho-dynamometer Prize Competition.

The Rotterdamsche Tandheelkundige Vereeniging (Rotterdam Dental Society) once more offers a prize of *f.*300 ($120, £25) for the invention of a gnatho-dynamometer suitable for use in dental practice.

The instrument is required to register a pressure up to 150 kilograms. Below 20 kgm. pressure the limit of error must not exceed 1 kgm., while under high pressure the limit of error should range within 2 kgm. The bite-plates must allow of introduction into an aperture of 1 cm.; if introduction be possible into an aperture of less than 1 cm. it will be regarded as a great advantage. The shape of the bite-plates is to be adaptable to the inclination of the masticatory surfaces. Under a pressure exceeding 20 kgm. the scale must be readily read off, or else calculable very readily. Although expected to register the pressure in only one direction, it should also allow of moderate lateral movement. In the front teeth only the normal incisal bite, not the overbite, should be measurable. The instrument must be simple, strong, and the parts which come in contact with the mouth must be readily sterilizable. The bite-plates should not damage the teeth, and must be so shaped that pressure can be brought to bear upon them at any point between the masticatory surfaces. After the pressure has been read off, the register must be easily readjustable.

Competitors are requested to submit a model of their instrument, postage prepaid, until October 1911, to the Rotterdamsche Tandheelkundige Vereeniging, 93 Aert van Nesstraat, Rotterdam, including a motto and directions for use, and a sealed envelope must be inclosed marked outside with the same motto, and containing the name and address of the inventor.

The jury is composed of the following dentists: B. Frank, A. A. H. Hamer, D.D.S., I. J. E. de Vries, Amsterdam; C. H. Witthaus, D.D.S., Rotterdam; besides a technical expert. The decision of the jury will be made public in December 1911.

The result will be announced to all competitors, to whom their models will be re-

turned. The prize will be conferred in January 1912, at the annual meeting of the Rotterdamsche Tandheelkundige Vereeniging.

M. Isebree Moens, *Sec'y.*

OHIO STATE DENTAL SOCIETY.

National Miller Memorial.

To the Dental Profession of America,—At the December 1909 meeting of the Ohio State Dental Society it was unanimously resolved that an American Memorial be established to perpetuate the memory of the late Dr. Willoughby D. Miller, as an evidence of the profession's appreciation of his laborious and fruitful researches for the scientific advance of dentistry.

From the consensus of opinion of various state and local societies, it was decided that the memorial take the form of a monument, to be erected in a suitable public place in Columbus, Ohio, the capital of Miller's native state. The monument is to consist of a life-size bronze of Dr. Miller, mounted upon a granite base of suitable proportions with appropriate tablets, the cost of which will approximate $8000.

Though his scientific career was in a foreign land, the great pride he showed in his American citizenship, the love for his profession in America, and his final plans for educating students in his own country in the line of work he had so ably begun, should make this memorial movement national in its scope, and to this end the committee in charge has selected honorary committees in the several states to co-operate in bringing this matter to a successful issue.

This movement has received the indorsement of the National Dental Association. Ohio will raise $1200 for this fund, and it is the desire of the committee to have one tablet to state that contributions were received from representatives of the profession in every state of the Union.

Contributions are desired from individuals as well as societies; in fact, many small subscriptions are preferable to a few large ones.

The committee has selected Dr. Weston A. Price, 10406 Euclid ave., Cleveland, Ohio, to act as treasurer of this fund, and to him all subscriptions should be made payable.

That your state may be represented in this fund and appear in the published list of subscribers, we ask your earnest support. Your response to this appeal will be the measure not only of the success of our committee but of the appreciation of American dentists for one who raised the standard of the profession.

Yours respectfully,

Edward C. Mills, *Chairman,*
16 S. Third st., Columbus, Ohio.
J. R. Callahan,
25 Garfield Place, Cincinnati, Ohio.
S. D. Ruggles,
Portsmouth, Ohio.

MASSACHUSETTS BOARD OF REGISTRATION.

A meeting of the Massachusetts Board of Registration in Dentistry will be held in Boston, October 26, 27, and 28, 1910. For applications and information address

Dr. G. E. Mitchell,
25 Merrimack st., Haverhill, Mass.

ILLINOIS BOARD OF EXAMINERS.

The semi-annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Illinois will be held at the University of Illinois, Dental Department, corner Harrison and Honore sts., beginning Monday, November 7, 1910, at 9 A.M.

The following preliminary qualifications are required to entitle to examination by this board for a license to practice in the state of Illinois: Graduates of a reputable dental or medical school or college, or dental department of a reputable university, who enter the school or college as freshmen on or after the school year 1906-7, must have a minimum preliminary education of not less than graduation from an accredited high school—or a certificate from the state superintendent of public instruction, equivalent officer or deputy acting within his proper or legal jurisdiction, showing that the applicant had an education equal to that obtained in an accredited high school; which certificate shall be accepted in lieu of a high-school diploma.

Candidates will be furnished with proper

blanks and such other information as is necessary on application to the secretary. All applications must be filed with the secretary five days prior to date of examination. The examination fee is twenty dollars, with an additional fee of five dollars for a license.

Address all communications to

T. A. BROADBENT, *Sec'y*,
705 Venetian Bldg., Chicago, Ill.

ARIZONA BOARD OF EXAMINERS.

THERE will be a meeting of the Arizona Board of Dental Examiners, November 14th to 18th, at Phœnix, Arizona. Candidates should make their application, and fee of twenty-five dollars should accompany same, at least twenty days before meeting.

The theoretical examination includes the following subjects: Anatomy, physiology, chemistry, materia medica, therapeutics, metallurgy, histology, pathology, operative and mechanical dentistry, oral surgery. Practical demonstration of skill in operative and mechanical dentistry will also be required, and candidates should come prepared with instruments and material for making fillings and crowns in the mouth.

W. A. BAKER, *Sec'y*,
Tucson, Ariz.

MINNESOTA BOARD OF EXAMINERS.

THE next regular meeting of the Minnesota State Board of Dental Examiners will be held at the Dental Department of the State University of Minneapolis, on November 15, 16, and 17, 1910.

All applications must be in the hands of the secretary ten days previously. All applicants must be graduates and present their diploma. Those having practiced in any of the following states for five years or more will be exempt from the theoretical examination: Iowa, Indiana, Michigan, Nebraska, Wisconsin, and Montana. Minnesota dentists are admitted to those states on same conditions.

For blanks and further information apply to

GEO. S. TODD, *Sec'y*,
Lake City, Minn.

MICHIGAN BOARD OF EXAMINERS.

THE next regular meeting of the Michigan State Board of Dental Examiners will be held at Ann Arbor, Mich., November 16 to 19, 1910, inclusive.

A. W. HAIDLE, *Sec'y*,
Negaunee, Mich.

MARYLAND BOARD OF EXAMINERS.

THE Maryland State Board of Dental Examiners will meet for examination of candidates for certificates November 10 and 11, 1910, at the Dental Department of the University of Maryland, Baltimore, at 9 A.M. Applications, accompanied by the fee of ten dollars, must be filed with the secretary prior to November 10th.

For further information address

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

CONNECTICUT DENTAL COMMISSIONERS.

THE Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Wednesday, Thursday, and Friday, November 16, 17, and 18, 1910, to examine applicants for license to practice dentistry, and for the transaction of any other business proper to come before them. Application blanks, rules, etc., will be forwarded by the recorder upon request.

By order of the Commission.

GILBERT M. GRISWOLD, *Recorder*,
783 Main st., Hartford, Conn.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE next meeting of the New Hampshire Board of Registration in Dentistry will be held from November 30 to December 2, 1910, at Masonic Banquet Hall, Manchester, N. H.

All persons desiring to practice dentistry are required to take an examination and become registered before beginning practice.

A. J. SAWYER, *Sec'y*,
Manchester, N. H.

NEW JERSEY BOARD OF REGISTRATION.

The New Jersey State Board of Registration and Examination in Dentistry will hold their annual meeting in the Assembly chamber of the State-house, Trenton, N. J., December 5, 6, and 7, 1910. All applications must be in the hands of the secretary ten days prior to the meeting.

For information apply to

Charles A. Meeker, *Sec'y*,
29 Fulton st., Newark, N. J.

ARMY DENTAL CORPS.

Memorandum of changes of stations and duties of contract dental surgeons, U. S. Army, for the week ending August 27, 1910:

R. F. Patterson, August 13th, ordered to proceed from Fort Sheridan, Ill., to Fort Benjamin Harrison, Ind., for temporary duty.

Geo. Graham, August 19th, left Fort Leavenworth, Kans., on ten days' leave of absence.

Herbert T. Risdon, August 18th, recently appointed, will proceed from San Francisco, Cal., to Fort Miley, Cal., for temporary duty.

John S. Marshall, examining and supervising dental surgeon, August 12th, admitted to Army General Hospital, San Francisco, Cal., for observation and treatment.

R. F. Patterson, August 22d, left Fort Sheridan, Ill., *en route* to Fort Benjamin Harrison, Ind., on temporary duty.

For the week ending September 3d:

Charles J. Long, August 29th, granted two months' leave of absence.

Charles J. Long, August 29th, reports for temporary duty at Madison Barracks, N. Y., from Pine Camp, N. Y.

For the week ending September 10th:

George E. Stallman, August 27th, returned to Fort Sam Houston, Texas, from Leon Springs, Texas.

George H. Casaday, September 3d, left from duty at Fort Baker, Cal., *en route* to the Philippine Islands, for duty.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING AUGUST 1910.

August 2.

No. 966,396, to J. F. Thompson and H. S. Hanstine. Investment holder for dental soldering.

August 9.

No. 967,086, to M. H. Tuttle. Crown for teeth.

August 16.

No. 967,413, to E. L. McCain. Tooth-brush.

No. 967,873, to Carl G. Franke. Plate swager.

August 23.

No. 968,055, to Mentor Howard. Dental articulator.

No. 968,306, to M. J. Wunderlich. Apparatus for administering anesthetics.

August 30.

No. 969,050, to John E. Evans. Artificial tooth.

No. 969,055, to John F. Hammond. Foot controller for electric motors.



DR. JOSEPH P. GRAY.

THE

DENTAL COSMOS.

VOL. LII. NOVEMBER 1910. No. 11.

ORIGINAL COMMUNICATIONS.

DEFICIENT DEVELOPMENT OF THE ARCHES OF THE DECIDUOUS TEETH, AND THE NECESSITY OF EARLY TREATMENT.

By J. LOWE YOUNG, D.D.S., New York, N. Y.

(Read before Section I of the National Dental Association, at its annual meeting, Denver, Colo., July 19, 1910.)

IN order to be able to study pathology we must have some knowledge of physiology. In order to be able to recognize malocclusion we must be familiar with normal occlusion; so in order to recognize deficient development of the deciduous dental arches we must have a mental picture of these structures when normal.

NORMAL DEVELOPMENT OF THE DENTAL ARCHES.

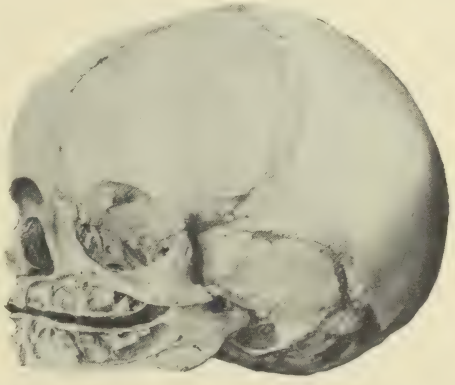
At birth the proportion of the face to the cranium is as 1 to 8; in adult life it is about 1 to 2.

Froriep has also made observations on this point in older children, and finds the following proportions:

Proportion of face to cranium.	
Early infancy	1 to 8
Two years	1 to 6
Five years	1 to 4
Ten years	1 to 3
Adult female	1 to 2½
Adult male	1 to 2

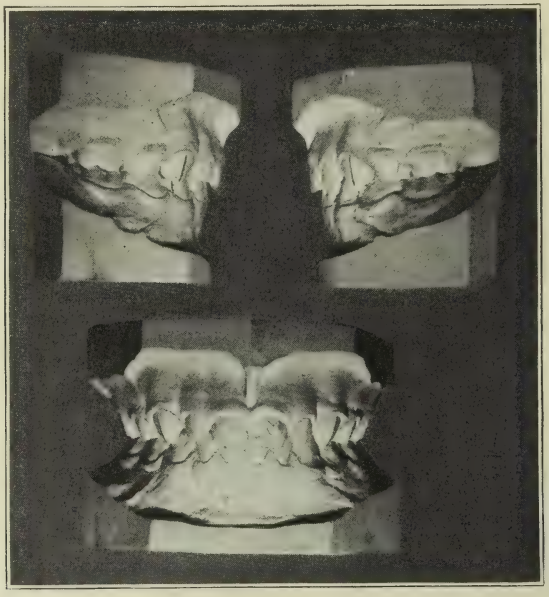
The vertical diameter of the superior maxillary bone at birth is very short, the sockets of the teeth being close to, if not in contact with, the orbital plate. (Fig. 1—Noyes.) The same is true of the mandible in regard to its vertical dimension.

FIG. 1.



As development takes place, these bones, which are very vascular, increase in size at a rapid rate, so as to accommodate the developing teeth. This causes the face to increase in size more rapidly than the cranium during the period in which the deciduous teeth are erupting.

Fig. 2.



At the same time a noticeable development of the nares takes place, which continues to increase until the eruption of the permanent teeth is complete.

The following, including Dwight's table, is from Rotch ("Pediatrics," 5th edit.): According to Disse, the nasal cavity begins to increase in height directly after birth, and goes on pretty rapidly until the beginning of dentition, when it becomes slow, until the second year is completed. After the first set of teeth has erupted, the growth is rapid until the end of the seventh year. The increase in breadth occurs in the last-mentioned period, which also is the time when the posterior opening doubles its size in six months, remains stationary until the end of the second year, and then increases again. The following measurements were made by Dwight:

Age.	Height of posterior nares.	Breadth between pterygoid processes at hard palate.
About birth	6 to 7 millimeters.	9 millimeters.
From twelve to sixteen months	13 "	16 "
" twelve to eighteen months	15 "	16 "
" fourteen to twenty months	14 "	17 "
" eighteen months to three years	15 "	21 "
" twenty-two months to four years	15 "	20 "
About six years	16 "	20 "
From seven to eight years	20 "	22 "
About eleven years	18 "	22 "
At seventeen years—female	22 "	20 "

In the embryo the hard palate lies above the level of the mouths of the Eustachian tubes; at birth it has descended so as to be on a level with them. This descent continues until about the eighth year, when we find the hard palate considerably below the mouths of the Eustachian tubes. During this time the maxillary bones increase in length from before backward so as to accommodate the developing teeth and cause the flat face of the newborn infant to assume a better balance—in fact, we might say almost a perfect balance. We seldom see a very homely child at the completion of the eruption of the deciduous teeth.

It is obvious that any pathological condition which prevents development of the nasal structures during the period of the eruption of the deciduous teeth is very likely to have a similar effect on the dental arches, and also that interruption of development of the dental arches will affect the development of the nasal structures.

We are all aware that there are twenty deciduous teeth, ten in each arch. They are usually in good arch alignment, and when fully erupted stand in close contact with each other. The age at which this stage of development is complete varies markedly; some children have teeth at birth, while others do not have any before the end of the first year. It is safe to state that children, as a rule, have complete deciduous dentures at from two to three years of age. (Fig. 2.)

THE ETIOLOGY OF MALOCCLUSION.

The fact that, with few exceptions, these deciduous dentures are in harmony both as to general form and size of the teeth is a strong argument against the idea of inheriting teeth too large for the jaws or jaws too large for the teeth. Who has ever observed in the deciduous dentures conditions at all similar to those found in the permanent set; of which Figs. 3 and 4, *a*, is a marked example? Fig. 4, *b* and *c*, shows results of treatment. The mother of this child, an intelligent and observing person, said that the child's deciduous teeth, while small, were in perfect arch alignment. If you have not found such conditions in the deciduous dentures—and I assure you that I never have—then it seems very improbable that they are due to heredity, but rather they point to deficient development from some cause or causes.

FIG. 3.

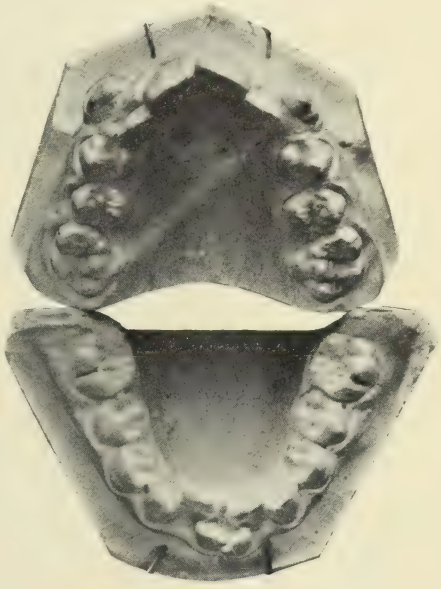


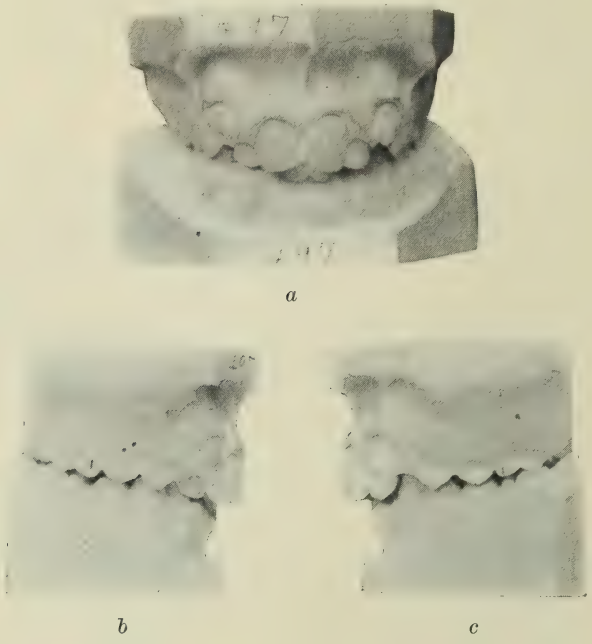
Fig. 5 shows models of a child of the same age as that shown in Figs. 3 and 4, with a similar arrangement of teeth and as pronounced a lack of development in the upper arch; but the lower arch is very different.

By studying these two cases a valuable lesson can be learned as to the etiology of malocclusion. The child whose teeth are represented in Figs. 3 and 4 showed general lack of physical development; mentally she was very bright. The one whose teeth are shown in Fig. 5 was well developed physically, but deficient mentally. She had been troubled with acute rhinitis for a number of years.

It is not to be inferred from the above that heredity does not have any bearing on malocclusion, but rather that we should be most careful to try to determine, if possible, just what is responsible for conditions so abnormal.

In Fig. 2 we observed what the normal arches of the deciduous teeth should in Figs. 3 and 4 develop, but fortunately in a less marked degree, as a rule.

Fig. 4.



a

b *c*

be when the full complement of teeth is fully erupted. Would this be a normal

From the time the deciduous teeth are fully erupted until the appearance

Fig. 5.



arrangement for a child of six years? By no means. It is from just such conditions that permanent arches as shown

of the first permanent tooth is a very important period in the development of the dental arches, and of the child gen-

crally. Unfortunately, normal development rarely takes place. The child of three years is supplied with teeth suitable to thoroughly masticate food, and he should be encouraged to do so, for by the vigorous use of these organs three times a day the growth of bone and muscle is stimulated, and, if not counteracted by pathological conditions of some sort, should result in normal arch development.

CAUSES FOR MALFORMATION OF THE DENTAL ARCHES.

In general, it may be said that any cause which prevents the normal occlusion of the teeth at any time during the developmental period will tend to cause malformation of the dental arches. Among the causes which prevent normal occlusion may be mentioned mouth-breathing, inflammation of the bone or its periosteum, or of the pericementum, or conditions causing pain when the teeth are in contact.

Numerous habits, such as sucking the thumb or finger, biting the lip or the cheeks, or the nails, or the tongue, either the tip or the sides, lip habits of various kinds, and lack of tongue pressure on the maxilla due to mouth-breathing, are also factors which cause malformation of the arches.

Dr. F. B. Noyes, in the *American Orthodontist* for May 1908, says: "The jaws are endo-membranous in their origin, but very early in their development a periosteum is formed over the surfaces of the bone already formed, and from that time on, the growth of the bone as an organ takes place through the functions of the periosteum, together with the articular cartilages and the peridental membrane. By these tissues the bone is built up, but by the periosteum the surface is sculptured and molded into form, and by the osteogenetic tissues inclosed within the surfaces of the bone the internal structure is constantly being rebuilt so as to adapt the organ to the forces to which it is subjected, with the least possible weight. The more carefully this is studied, the more evident it becomes that bone is formed and reformed in response to mechanical stimuli, and that the entire surface is arranged in harmony with the mechanical stresses which result from the forces applied to the teeth and the surfaces of the bone."

Dr. Noyes sums up his entire paper by saying "The adult maxillary bones, which are such important factors in the beauty and harmony of the face, are the result of the sum total of all the forces acting upon them," and that "Normal occlusion is the agency by which these forces are distributed and preserved in balance."

IMPORTANCE OF EARLY TREATMENT OF CARIOUS DECIDUOUS TEETH.

It is therefore of the utmost importance that the deciduous teeth should not be neglected and that caries should not be allowed to continue, for when decay reaches the point where mastication becomes painful the child is almost certain to form the habit of bolting his food, and this habit once formed is likely to persist through life. It is your duty to instruct mothers to bring their children early, so that they may become accustomed to having their teeth examined, and may become acquainted with their dentist. If this has been neglected so that the child's first visit is for relief of pain, the dentist should do as little as possible at that sitting. He should be most careful not to cause undue pain. It is surprising how much young children will endure if approached in the proper manner. Children are very imaginative and fond of fairy tales. So tell them that bad fairies have made a home in the tooth and that you are going to take them out and put good fairies in. Say nothing about "not going to hurt." Avoid the use of the word "hurt" entirely. But rather say: "I got that bad fairy all but his toe," "I got that bad fairy all but his finger"—being careful to mention "bad fairy" each time you have to pause in your work to let the child rest a moment. Don't be in a hurry, and *never* deceive the child!

Whenever possible without overtaxing

the child, cavities in the deciduous teeth should be filled with a durable material. When temporary work must be inserted, better results will be obtained, especially on the approximal surfaces of the molars, by using either gutta-percha or a combination of cement and amalgam.

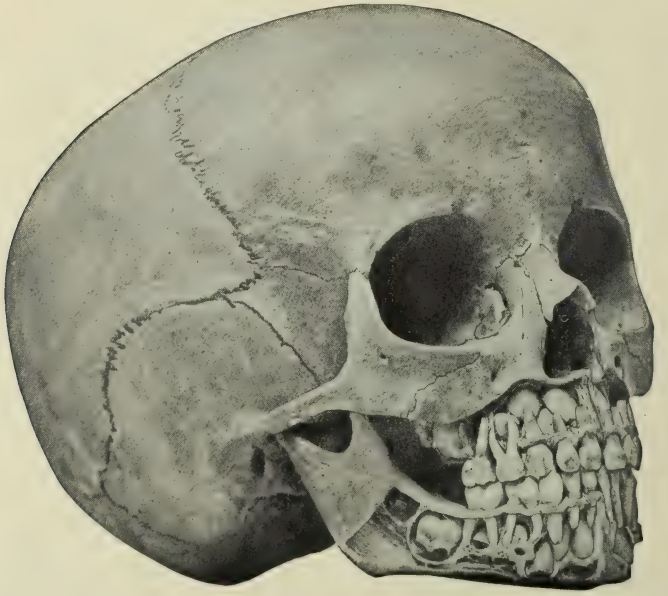
IMPORTANCE OF MASTICATION IN CHILDREN.

It might be well at this time to say a word to those medical specialists who advise mothers to so prepare foods that mastication is not required, giving as the reason that children of this age will not masticate. We are creatures of habit, and young children form habits far more quickly than their elders. When once the habit is formed of swallowing food without thorough mastication, it is difficult to overcome, especially when the older members of the family bolt their food. Children are apt to mimic those with whom they associate, and they do so in eating as in other things. If a child with a full complement of deciduous teeth which occlude properly is supplied with foods of such a nature that thorough mastication is a necessity before deglutition, he will soon establish the habit of masticating, and the pleasure of eating will be enhanced to a marked degree.

MODE OF ERUPTION OF THE PERMANENT TEETH.

By examining skulls we find that at from five to six years of age the crowns of the permanent teeth which replace the deciduous ones have all been formed and are lying in their crypts, the incisors and canines being lingual to the roots of their predecessors and the bicuspids between the roots of the deciduous molars. (Fig. 6—Cryer.) If there has not been sufficient growth of bone to accommodate these permanent teeth they are very likely to become displaced by pressure. In this stage of their development they resemble loose peas in a pod, and might almost be displaced by a sudden jar. The crowns of the first permanent molars are also formed and lie distal to the second deciduous molars. As subsequent

FIG. 6.



—*Cryer.*

development takes place and the root begins to form, the crown advances in the opposite direction from the growing root and will follow the course of least resistance.

In order that these developing teeth may have sufficient room, the maxillary bones must develop to quite a marked degree in three directions. The increase in width, at five or six years of age, should be sufficient to accommodate the permanent teeth that replace the deciduous incisors and canines. In other words, the distance between the mesial surfaces of the first deciduous molars in the arch curve should be as great, or a little greater, than the combined widths of the permanent incisors and canines. The increase in a vertical direction by six or seven years of age should be enough to allow the first permanent molars to grow to normal length before they occlude with their antagonists.

MALOCCLUSION DUE TO FAULTY ERUPTION.

It sometimes happens, but not often, that the first permanent molars will erupt to their proper height, and in so doing open the bite, leaving spaces between the deciduous molars. (Fig. 7.) There must also be a lengthening of the maxillary bones so as to accommodate the first permanent molars which are about to erupt, and also to give room for the second molars, the crowns of which are now formed.

It is not uncommon to find distal occlusion of the lower teeth (class II) prior to the eruption of the first permanent molars; and we sometimes find, though less often, mesial occlusion of the lower teeth (class III) at this early age. Fig. 8 is made from models of one of the former, and Fig. 9 is from models of one that was undoubtedly in distal occlusion before the first permanent molars erupted. Both of these children suffered from adenoids and were operated on at an early age, but nothing was said, either by the family physician or the rhinologist, of the advisability of correcting the malocclusion or the facial deformity; but an intelligent mother, learning of the advantages of early treatment of such conditions, placed these children under the care of an orthodontist.

FIG. 7.



Examination of these models shows that with both of these children the lower incisors impinged on the palate to such a degree that any attempt to masticate food was painful. The trained nurse who had these children in charge reported to the orthodontist a pronounced improvement in the mastication of their food as soon as the treatment had progressed to the stage where the lower teeth failed to reach the palate.

CONSEQUENCES OF DEFICIENT DEVELOPMENT OF THE MAXILLA.

Up to the seventh year of age the temporo-maxillary articulation is so imperfectly formed that the mandible may be displaced either forward or backward to some extent. Deficient development of the maxilla either in length or width

may cause distal displacement of the mandible, if the influence of the inclined planes of the teeth favor such displacement, resulting in distal occlusion of the lower teeth (class II). It may be bilateral or unilateral according to the lack of development and plane influences.

Deficient development of the maxilla, when more pronounced, either in length or width, may cause the mandible to protrude, if such a result be favored by the inclined planes of the teeth—for example, if the upper deciduous incisors, on eruption, should just pass lingually to

Fig. 8.

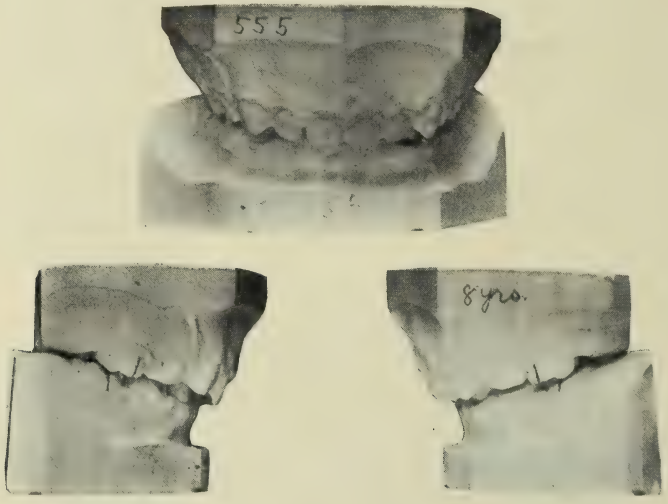
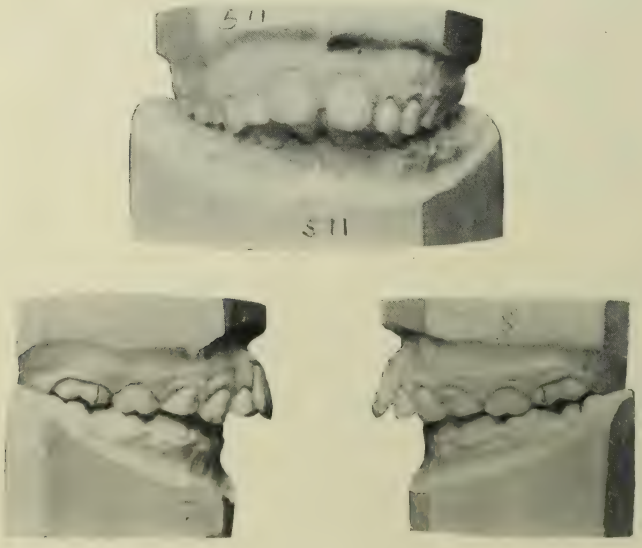
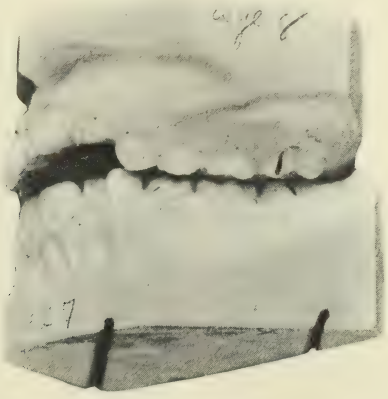


Fig. 9.



the incisal edge of the lower ones. As they increase in length their action on the lingual incline of the lower incisors would be to carry the mandible forward, and together with the adverse influence of the inclined planes of the other teeth, would result in mesial occlusion of the lower—class III. Or if, owing to the lack of lateral development of the maxilla, combined with the lack of vertical development of the incisors, the deciduous molars on eruption meet their antagonists end to end, the mandible might be protruded so as to allow a better occlusion. And where the influence of the inclined planes is such as to carry the mandible to either side, the result would be unilateral mesial occlusion of the lower teeth, or a subdivision of class III.

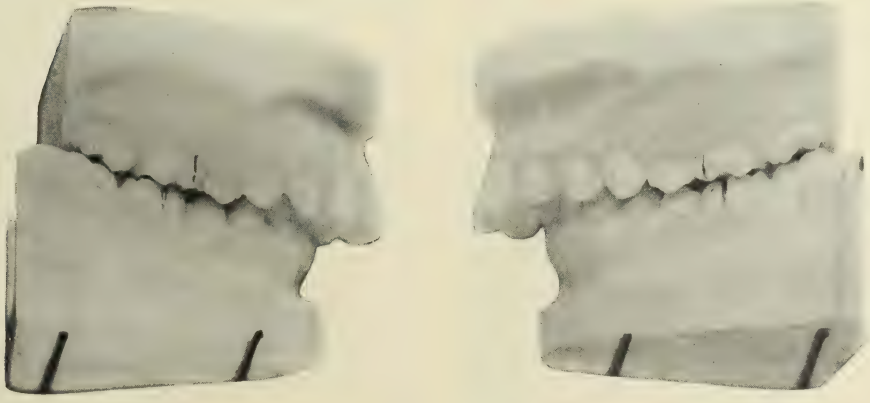
FIG. 10.



CONSEQUENCES OF DEFICIENT DEVELOPMENT OF THE MANDIBLE.

Deficient development of the mandible in length, particularly of the rami, may cause bilateral distal occlusion of the lower teeth, class II. If the deficiency is confined to one ramus, the result would be unilateral distal occlusion,

FIG. 11.



or a subdivision of class II. A child allowed to suck his thumb is likely to develop a distal occlusion on the side of which the thumb is a part. (Fig. 10.) When both thumbs are sucked at the same time or alternately, there will be bilateral distal occlusion. (Fig. 11.)

Fig. 12.



Fig. 13.



Fig. 14.



Fig. 15.



NECESSITY OF EARLY CORRECTION OF MALOCCLUSION.

With such evidence as that confronting us, it would be most unwise to advise parents to wait. Wait for what? It must be apparent that the longer such conditions are allowed to continue, the greater is the handicap—the more complicated the treatment, the more difficult the retention, the longer the period of retention on the permanent teeth, and the less likelihood of sufficient growth of bone necessary for final success. If you were building a house and made a mistake in the foundation, would you advise waiting until the house was completed before rectifying your error?

It is the duty of those who treat malocclusion of the teeth to try to prevent the permanent teeth from erupting in malocclusion. Every member of the dental profession should be able to recognize the necessity of treatment of these conditions and should either prepare himself to treat them intelligently, or else turn them over to those who are proficient.

And let me say that the time is rapidly approaching when the laity is going to demand such services, and the dentist who is not prepared to render them or is not liberal enough in his views to refer the cases to one competent to do so is going to lose that portion of his *clientèle* having children who may require such services.

Fig. 16.



Fig. 17.



The accompanying pictures, made from photographs taken before and after treatment, are shown as proof of the improvement in appearance. [A short description was given of each case.]

Figs. 12 and 13 show profile and front views of a girl of eleven years of age before treatment was begun. This was a class II, division 1, case. Figs. 14 and 15 show profile and front view six months later, after the case was retained. Figs. 16 and 17 show profile and front views two years later.

Figs. 18 and 19 show profile and front views, before treatment, of a girl of eleven. This was a subdivision of class II, division 1, the child being a constant lip-biter. Figs. 20 and 21 show profile

and front views six months later. Figs. 22 and 23, the same three years later.

FIG. 18.



FIG. 19.



FIG. 20.



FIG. 21.



Figs. 24 and 25 show profile and front views before treatment was begun, of a boy ten and one-half years old. This was a case of class II, division 1, with the lower anterior teeth striking the palate. Figs. 26 and 27 show profile and front

views of the same boy nine months later.

Figs. 28 and 29 (previously published in DENTAL COSMOS for April 1909, p. 405) show profile and front views of a child six and one-half years old, before treatment was begun. This child had the full complement of deciduous teeth and had not yet erupted a permanent tooth. There was no malocclusion, but no spacing in the incisor region to accommodate the permanent teeth. Figs. 30 and 31 (also taken from DENTAL COSMOS for April 1909, p. 405) show profile and front views of the same child a year later.

FIG. 22.



FIG. 23.



TREATMENT.

Plaster models. Before beginning treatment one of the first requirements is accurate plaster models made from good impressions. In children from three to six years of age fairly accurate impressions may be obtained with modeling compound, but as a rule this material causes more discomfort than plaster when properly used. Children are not accustomed to taking hot substances into their mouths, and a timid child is apt to be frightened by the heat necessary to render the modeling compound sufficiently plastic. It must be admitted that it takes more time to procure models from plaster impressions, but the result is so far superior to that obtained by modeling compound that it is time well spent.

Recording photographs. Photographs are advisable and assist greatly in the study of the case and serve as a record, together with the models, of subsequent development.

Appliances. When fixed appliances are used in the treatment of these young children, they should be so constructed that little time is required for cementing them in place. It is not advisable to put more than one fixture in the mouth at one sitting, and at least one week should elapse before anything more is added. The appliances should be much lighter in construction than those used for adults. From No. 18 to No. 20 gage expansion arches have been found most

efficient in the treatment of these young children.

Fig. 24.



Fig. 25.

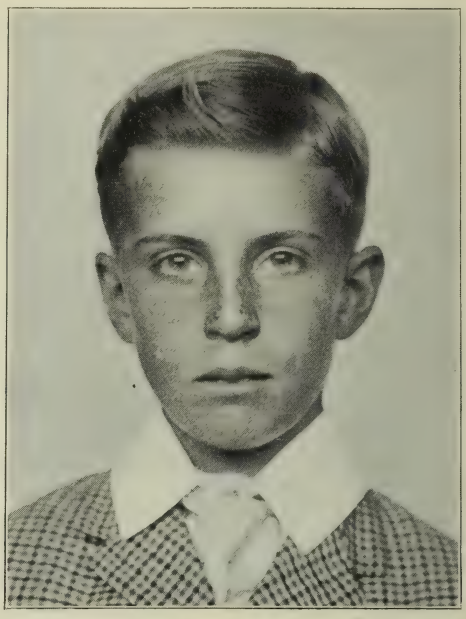
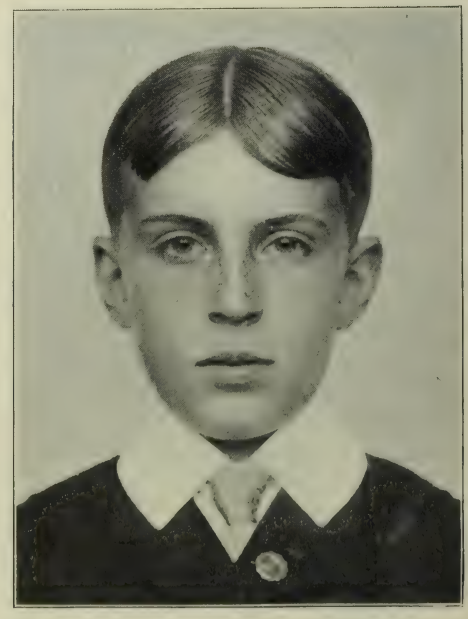


Fig. 26.



Fig. 27.



Rotated teeth. Rotated teeth should be turned to normal position as early as possible, and it has been found very advantageous to have bands of various sizes prepared, so that when a bicuspid presents in a rotated position a band can

be cemented on it with a spur properly placed so as to ligate and rotate the tooth before the root is thoroughly formed. Teeth rotated at this stage of development require but a few months of retention, but if left to adult life must be retained for many years to make certain that they remain in place.

Fig. 28.



Fig. 29.



Fig. 30.



Fig. 31.



THE CONDITIONS OF SUCCESS.

By J. LEON WILLIAMS, D.D.S., L.D.S., London, Eng.

(Read before the New York State Dental Society, at its annual meeting, Albany, May 5, 1910.)

THERE are, in my opinion, but two general ideas or ideals of success, and they may be defined as being founded on the conception of power and the conception of acquisition. The highest form of success is synonymous with evolution, and evolution is development in power. This is the conception of success that has always been held by the world's greatest teachers, by those who believe that man is a creature of unmeasured and perhaps immeasurable possibilities. By processes of material and spiritual evolution man is becoming more and more the master of nature and of himself. Powers previously unsuspected are constantly appearing, and the development of every new power seems to supply the soil in which still higher faculties take root and grow in turn.

Success, therefore, in the broadest and best interpretation of the term, should be measured by the extent to which the individual, by his own volition and effort, is assisting the great inherent constructive powers of nature in his own evolution. But this, I fear, is not altogether the conception that the great majority of people have in mind when they talk or think about success. To *acquire* rather than to *develop* is the prevailing idea of success. To acquire money, friends, and popularity—that is the usual thought of what success means. The success of acquisition, of course, is perfectly legitimate, if one but maintains the right mental attitude toward it; in fact, it should always come, and always would come in a properly organized society, as the natural result or reward of the success of development or evolution. But that mental attitude is the all-important thing. It is what a man intends in his action that counts, so far as he is concerned.

THE IDEAL OF SUCCESS.

What, then, is to be our ideal of success? We must determine this before we can take the first step toward discussing the principles or elements of success. Let us try to get at the real heart of the matter. To the young man just entering our profession (and it is to him that this paper is chiefly addressed) the word "ethics," which is intimately associated with thoughts of success, is usually interpreted as a term of restraint, when it should connote freedom and liberty of the highest order. But the subject is not often presented so as to permit of such an interpretation. The sole aim of ethics is, or should be, the placing of a high estimate on the value of conduct, and by conduct I mean a man's whole attitude toward himself and his fellows. A man starts out in life with certain powers and accomplishments which he desires to dispose of to his fellows in return for certain benefits which they can bestow on him. A man is successful just to the extent to which he can materialize those powers and accomplishments, just to the extent to which he can convert them into something that will add to the comfort and happiness of his fellows; and ethics should teach him how this exchange can be most effectively brought about, how society may realize the full value of a man, and how a man may develop and express himself with

the greatest freedom and liberty. It is my conviction, founded on the study and observation of many years, that the chief cause of human failure in any position in life is man's willingness to dispose of his powers and accomplishments at something below their real value—his willingness to sell himself too cheaply—and what I have to say in this paper will be said from that point of view. The first and most important element in all human success is to *believe* greatly—to believe in oneself, in one's destiny, and in the absolute benignity of the powers that control that destiny. If that belief, that faith, does not underlie all detail, then the detail is mere surface trumpery. A witty after-dinner speaker in London has just made the suggestion that what our weary, overworked, depressed world most needs is the appointment of official *encouragers*—men who shall go about quietly and endeavor to make people think more highly of themselves. There is a deep philosophy behind this pleasantry. To believe greatly is to will greatly, and to believe and to will greatly is to achieve greatly. The highest form of individual success is that in which work or calling reacts on life and character, ever stimulating further effort and higher evolution, and the material reward of such a life should always be sufficient and adequate.

ELEMENTS OF SUCCESS IN THE DENTAL CAREER.

If you agree with my conception of what constitutes success, let us make application of the foregoing statement of general principles to our own occupation. Let us follow the career, step by step, of a man from the moment that he decides to become a member of our profession, and mark the influences and conditions—or, in the terms of my subject, the elements—out of which success may be constructed.

CONDITIONS FOR THE DENTAL STUDENT'S SUCCESS.

Our hypothetical young man's chief asset at the commencement of his career will be his knowledge of all the details of our professional work and his power of making practical application of that knowledge. This asset bears about the same relation to professional success that capital and credit do to mercantile success. It is, therefore, highly important that the value of this asset should be raised to the highest possible degree. It is thought to be in the nature of a commonplace or platitude to say that the first and most important condition of success in any calling lies in the detailed knowledge that a man has of that calling, but I am sure very few young men realize the full significance and meaning of that commonplace expression, for the simple reason that its full meaning is anything but commonplace. In its broadest interpretation it involves the deepest problem of our material and possibly of all higher existence—the problem of the acquisition of power over our own organism and over our materials, and the latter may almost be said to be involved in the former. In the very forefront of the conditions necessary for acquiring power over our own organism must be placed determination or will, a quality capable of infinite or at least of indefinite extension. There, again, we seem to be uttering a commonplace, and again I must insist that these commonplaces contain the deepest philosophy of life and have become commonplace only because they are spoken without thought. Let our young man, at the moment of deciding upon his career, determine as completely and firmly as he can that he will enter upon no course of study or action he has not first decided to be well worth his best effort, and once having reached this decision he should allow nothing to stand in the way of making the strongest effort possible in the particular line of study or action in hand.

The definite knowledge or power gained by conquering as thoroughly as possible each problem attacked, constitutes only the smaller part of the benefit derived from pursuing such a course; *the larger benefit comes from the contribution which every such effort makes to the firm establishment of the habit of*

always willing to do the best that is in us. It is impossible to overestimate the importance of such a habit in the development of human power. To send the impulse of strong will along our nerves, setting our muscles in action to perform in the most thorough and efficient manner possible any particular piece of work, not only renders it easier to perform that work a second time, but it actually increases the power to reach a higher standard at every succeeding performance. On the other hand, any falling away from our own highest standard actually weakens our power for any subsequent effort. This is not a statement of fancy, but of fundamental law. These are facts involving the first principles of physiology and psychology, upon the operation of which all evolution depends. It is the ignoring of these principles that leads to that appalling waste of human energy that we may daily witness on every hand, a waste five times as great as the energy required to do the necessary work of the world.

The way, therefore, to conserve our energies to the utmost and to develop our power to the utmost is to undertake no useless or worthless action, and to always do in the best possible manner whatever we undertake. I wish the great importance of these facts could be brought home to every student in our dental schools. Success depends upon these things more than upon all else—not only success in all material ways, but also that higher and more precious kind of success, the success of strong character-building.

What the dental student of today most needs is not greater opportunity or greater variety of work, but a nobler ambition and a stronger will to take advantage of the rich opportunities already within his reach; and I think that the teacher places a poor and cheap estimate on his own work and his own duty when he tries to absolve himself in a more or less fictitious rivalry of opportunity for the student. The true teacher, the man who believes in himself, in the real dignity and significance of life, and in the responsibility of his calling, can accomplish far greater results than are commonly realized with far less material or opportunity than exists in any respectable dental college of today. The chief conditions or elements of success lie right here—in starting the student right and helping him into that attitude of mind in which he will place a high value upon himself and in which he will clearly see in his profession an opportunity for noble accomplishments. And in this attitude toward himself and his profession the young man entering upon his life-work will also find the basis of his attitude toward the public, which is the second important element in his success. It is simply impossible for any man to maintain the conditions necessary to success, if, in his relations with the public, he finds within himself the smallest tendency to speak or even secretly *think* in terms of apology for his calling. Even that expression is not quite strong enough to convey the force of my conviction.

CONDITIONS FOR THE DENTAL PRACTITIONER'S SUCCESS.

The man who in preparing himself for his life-work has been governed by the principles and conditions I have mentioned should be so well fitted for that work as to feel that he is complete master of the situation in his own domain. His belief in himself and in the value and beneficence of his work should be so strong that he will naturally and spontaneously maintain toward his patients an attitude of quiet, genial, but *masterful* control of all the conditions of his practice. While showing a willingness to confer with his patients on all points, he should make them feel that the ultimate decision must always rest with him, nor should there ever be the slightest departure on his part from this position. His future success depends more upon this than upon any other thing except efficiency in his work. But in maintaining this position he should never allow himself to be forced into showing the least irritation with his patients. Great strength lies in an earnest but quiet and

finely poised nature. To be masterful does not mean to be overbearing, dictatorial, or over-emphatic. Masterfulness lies in attitude and poise of mind rather than in speech. It is born of character, rather than the accident of position. Probably the silent, secret interplay of psychic forces always really counts for more in human relations than our coarser, more obvious expressions as displayed in speech and action; and these finer forces can only be developed by the practice of the principles already indicated.

Next to this more general relation of the dentist to his patient I should mention as important to success the cultivation of methods of operating in which there should be the fewest possible false movements. If almost any man will watch himself closely through one day, I think he will be astonished to see how many movements he makes which count for nothing, which result in no advance in his work. To cultivate to the utmost the avoidance of false movements is not only to secure great economy of time and energy for the dentist, but it is the most humane method for the patient. It is a curious but easily understood fact that in the work of excavating cavities the more or less false movements of timidity growing out of a desire not to hurt our patients really cause more pain than the work of the firm, sure, bold hand. Most patients are quick to see and appreciate this.

But it is not my purpose in this paper to enter much into the detail of the elements of success. Our society papers and the publications in our journals are filled with these details. It is rather my object to call attention to the great foundation principles out of which successful detail is developed. We but confuse our minds when we try to study the meaning of details apart from the great principles which govern their significance.

THE SOURCES OF REAL SUCCESS THE SAME IN ALL CALLINGS.

The world's greatest artist, Michelangelo, writing to an acquaintance after the death of his friend, Cardinal Ippolito, said: "I see that I cannot depend upon the promises or assistance of others, but must rely upon myself and try to do something of worth." To rely upon himself, to listen to that inner voice which every man has, and which it always pleased Socrates to call his good *dæmon*—that has been the secret of the success of every great man. The elements of success in dentistry are precisely the same as they are in any other occupation that men engage in. Success is not due to any particular method of bookkeeping or any particular way of using particular materials, for that would mean that we are the slaves of our methods, tools, and materials—and that condition is often true, and is why so many only half succeed, or fail altogether. Success is won by our becoming masters of ourselves, our tools and materials. Real success is won by the constant cultivation of will-power, energy, courage, and sincerity, and there is no other secret in success than that. The one great problem of teaching, the all-important condition on which a successful professional man is to be made out of a student, is, how to arouse the latent, dormant will-power, energy, and courage of the student; how to make him see and fully realize that success is surely within his reach, that he is the sole arbiter of his own fortunes; that even in such rare instances as when it is one man against the world, the one man may be, if he will, stronger than the world. And the joy of that! The joy of the master, the joy of conquering on your own terms, which you may always do if you are willing to pay the price—the joy of that is beyond anything that life has to offer. There is no more subtly false teaching than that man is the plaything or slave of predetermination, or fate, or destiny. Man is the slave of fate or the universe only to the extent that he is ignorant of or defies the laws of his own being, which are one with the laws of the universe. If there be any legitimate use for the word destiny in connection with man's career, then we may say that man is destined to become the ruler, not the slave, of the universe.

To act always with will, courage, and sincerity, and to believe that in so acting all the great powers of the universe are with us, is to insure the best and truest success here; and when we have finished here, along those lines, we shall probably, in the language of Sir Oliver Lodge, "Go upstairs and rule a planet!"

SECTIONAL INLAYS.

By SAFFORD G. PERRY, D.D.S., New York, N. Y.

(Read before the Southern Branch of the National Dental Association, at Houston, Texas, May 4, 1910.)

TO be confronted with the filling of a large cavity in a tooth in the human mouth is to be confronted with a problem that is always interesting and sometimes very difficult. To meet such a condition intelligently is one of the great objects of dental education. It has taxed the ingenuity of the best operators from the earliest days to the present time.

THE AVAILABLE FILLING MATERIALS.

If our ordinary oxyphosphate of zinc were a permanent material in the mouth, the filling of any cavity in any tooth would be a very simple matter, and the work would lose much of its present interest. But as no plastic has yet been found that is permanent, and that fulfils all the conditions of the ideal filling, we must continue, as during the last half-century, to make the best use we can of gold and amalgam and the porcelain and gold inlays. As we are considering only the so-called permanent materials, we must of course exclude gutta-percha and the different cements.

By a further process of exclusion, in very large cavities we are sometimes led to reject gold because of the great difficulty in working it, and amalgam because of its color and its liability to stain the teeth.

For permanent work we are then left with only the porcelain and gold inlays from which to make our choice. As these two materials have serious defects it must be seen how poverty-stricken we are in materials for filling and saving human teeth.

Gold. From the experience of the last half-century it is evident that we shall make no further advance in the use of gold. It is doubtful if it will ever be prepared in better form for our use than at the present day. It is safe to say that it will never be made more adaptable, or in a form for easier use. It is also doubtful if our most expert operators will ever discover better methods of use than those now well known.

Amalgam. Of amalgam, about the same may be said. Its objectionable color will probably never be overcome. It may be better and more uniformly made in the future, and more used when our profession swings around the circle and comes back to a more serious and more intelligent consideration of its merits and a more patient and careful and accurate use of it. When we get over the habit of considering it cheap stuff, to be used hastily and carelessly and left unfinished, we may awaken to the fact that we have entertained unawares a black devil that after all has a white angel in its substance that can be made to appear by proper use.

THE PORCELAIN AND THE GOLD INLAY.

If, then, we must accept gold and amalgam as now used as having about reached the limits of all possibilities, it

is fitting for us to take up seriously the porcelain and the gold inlay in order to learn if either or both can be put to better use than they are at the present time. If our hope in the future must lie in the direction of these two inlays, we must strive to perfect them as for over a half-century we have striven to perfect the gold and amalgam filling.

Strong points of either. In doing this we must begin by making a study of their weak points. Before doing that, however, let us for a moment consider their strong ones.

I said that an oxyphosphate filling would be nearly the ideal filling if it would only last. Its weak point is its exposed surface. Every porcelain and gold inlay, when set, is in effect an oxyphosphate filling, but with its weak side covered and therefore eliminated. This is why these fillings are so safe even when put in by unskilful hands. The personal equation does not count here as in the packing of gold.

In the front of the mouth, for esthetic reasons the porcelain fillings are indispensable. For the back teeth the gold inlays make better fillings, because they are not brittle and because their edges can be burnished to a perfect fit. I consider this perfect fit to all parts of the walls of a cavity as the first and greatest advantage of the gold inlay over the gold filling. From the standpoint of durability this inlay comes the nearest to the ideal filling. Of course, the strong point of the porcelain filling is its imitation of nature. This is often of such transcendent importance that its brittleness and lack of edge adaptability is forgotten.

All this is well known and need not be stated except for the reason that I am seeking for a comprehensive point of view from which all the evidence may be seen in the ratio of its relative importance.

Weak points of either. I come now to the weak points of these two inlay fillings. In my estimation the weakest point they have in common is the fact that, since they have to be constructed so that they will go into the cavity, they are so made that they can come out. The second weakness is that they compel such severe cutting of the teeth.

WEAKNESSES OF PORCELAIN AND GOLD INLAYS OVERCOME BY SECTIONAL INLAYS.

This paper is written in the hope of showing how these two weaknesses can be at least partly overcome. This will be accomplished by the use of sectional inlays, as well as by closer attention to doweling the cavities and the inlays. These sectional inlays are only practicable in large cavities.

The DENTAL COSMOS for September 1909 contains illustrations made from casts which I showed before the New York Odontological Society at its monthly meeting in March 1909, at which I explained the use of sectional inlays which I had for several years been making in my office. Since they were shown I have employed them more extensively, and I am satisfied that they have advantages that will entitle them to a permanent place in our practice. Those I have made were adapted for the most part to large cavities on the approximal surfaces of the bicuspids and molars, and to some extent to the approximal surfaces of the incisors. They can be still further used in any class of cases when it is desirable to anchor a filling so that it cannot get out of the cavity. And this anchoring of a filling is of great advantage, as will be seen by the description.

METHOD OF MAKING A SECTIONAL INLAY FOR A COMPOUND CAVITY IN AN UPPER BICUSPID.

For instance, let us take two large cavities on the opposite approximal surfaces of the upper bicuspids. If the enamel is not already crushed-in on the grinding surface, it must be cut away to give access to the cavity. Instead of enlarging the openings to the size of the largest diameter of the cavity, as must be done for the insertion of porcelain or gold inlays, I prepare the cavities nearly as for gold foil fillings, and then with modeling wax take a sectional impression of

one-half or two-thirds of the cavity in the buccal side. These impressions are not so large but that they can be removed through the openings into the cavities. A very thin sheet of soft copper or a thin tempered steel matrix being used, the wax models can be shaped to a perfect contour of the teeth. From these wax models either porcelain or gold inlays are made in the usual way. Before they are removed from the cavities their free surfaces should be trimmed and grooved to receive the fillings to be put into the cavities that are left after they are set. These grooves become the equivalent of the ordinary retaining groove that most operators make on the sides of cavities for retaining fillings. If gold inlays are to be used, they are made in the usual way, as before stated. If porcelain inlays are preferred, they are made by embedding these models in plaster so as to make a matrix, which when boiled out in stearin becomes hard enough to bear the burnishing of the gold or platinum foil used in baking the porcelain. The retaining groove made in the wax model will be reproduced in the gold inlay, but not, of course, in the porcelain one. This groove can be easily ground in the porcelain after it is ready to be set. If preferred, these wax models can be set in amalgam that exactly reproduces the part of the cavity desired, and which makes a strong-edged matrix.

When these inlays are set to their places with cement there will be left a cavity of simple proportions which can be filled in the usual way with gold or amalgam. In a very few instances I have put into these secondary cavities still another inlay, but generally they can be more quickly and more securely filled with gold or amalgam.

ADVANTAGES OF THE SECTIONAL INLAY.

If you ask me what have I gained by this procedure, my answer is that I have been saved from the cruel cutting away of the teeth, and I have set an inlay that cannot be displaced, while I have made a filling that is as perfect as any filling yet known.

The thoughtless, cruel cutting away of the teeth which seems to be so common in the present period of our profession is a practice that shocks me more than anything I see in dental practice today. Perhaps I am old-fashioned, and prejudiced in favor of old ways, but I do not want to be young enough and modern enough to lose my reverence for human teeth. The first paper I ever wrote and published was written under the influence of Dr. Varney, who opened all cavities for the use of nearly straight pluggers and cohesive gold. In that paper I advocated the same practice. With more confidence in my own handiwork than in the handiwork of nature, I cut and slashed with the recklessness of a bull in a china closet and with no more conscience. At that time, like most boys, I was barbarian enough to take delight in killing game, in breaking off fruit-tree branches for the blossoms, and in being strenuous generally.

Later I gave away my guns, planted trees instead of stripping them, and took time to study and admire the shapes of the teeth instead of recklessly cutting them. I learned to use soft gold which could be accurately filled under and around ledges of enamel that before I had boldly cut away. Except when I desire to obtain free margins for approximal fillings, that habit has grown with me, and today I am tender-hearted toward human teeth and willing to take more time and trouble in striving to save them as nature made them. Naturally, therefore, I shrink from cutting the teeth so much as is necessitated in providing for the insertion of porcelain and gold inlays as they are generally made by the profession at the present day.

These sectional inlays are like something sent from heaven, and I find I can with considerable ease and with saving of time make better fillings with them in large cavities than I have been able to make before.

Of course, the finished filling will be more to the taste of the patient, as well as the operator, if the cavity to be filled, after the inlay has been set, is filled with gold. This can easily be done so per-

fectly that the point between the filling and the inlay will not show, so that a superficial observer would say that the tooth was filled throughout with gold foil, or with a complete gold inlay.

FINISHING SECTIONAL INLAYS WITH AMALGAM.

Rather than cut the tooth so cruelly as is now generally done, I have elsewhere advocated the filling of approximal cavities in the molars, and in a few cases in the bicuspids, with Standard amalgam. Please note that I say Standard amalgam, as that is the only one I have ever found to satisfy me; there may be others as good, but if so I have never found them.

If in approximal cavities in bicuspids and molars, after setting these sectional porcelain or gold inlays on the buccal sides, the remaining cavities are not accessible so that they can be accurately filled with gold, they can be filled with Standard amalgam in such a way that the finished operation will be a perfect piece of work when viewed from the standpoint of utility and durability, and without the slightest chance of the discoloration of the teeth on the buccal sides.

TREATMENT OF THE CERVICAL BORDER.

In making these sectional fillings there is one point that needs more than usual care, whether they be finished with gold or amalgam. That point is where the inlay and the filling are to meet at the cervical wall. The inlay on the side that is to receive the filling should be filed or ground to a flat surface, so that there shall be a clean-cut angle where the inlay terminates at the cervical border. This will make it possible to easily make the filling perfect at that point. In most cases I prefer not to let the inlay, whether it be porcelain or gold, extend across the cervical border, because I think I can make a better filling along that border with either gold or amalgam.

If a porcelain inlay extends across that border the thin film of exposed cement in time will dissolve, and a crevice be formed that will encourage the recurrence of caries. This may not occur in many years, but it will occur in time. If a gold inlay is made, nearly the same objection will arise, as it is not possible to thoroughly burnish the gold against the border of the cavity. The space is too narrow to do this burnishing thoroughly. I have little fear of cervical borders while making ordinary gold foil fillings, because the gold is packed squarely against the cavity wall. I think a recurrence of caries oftener sets in at the cervico-lingual or cervico-buccal border, because in each case the gold is packed against the side walls, and the adaptation is not likely to be so perfect.

INDICATIONS FOR SECTIONAL INLAYS.

In advocating these sectional inlays for large cavities—and they are only suited for large ones—on the approximal surfaces of bicuspids and molars, I do not want to be considered so interested as to lose my sense of proportion, and so impulsive as to let my enthusiasm run away with my judgment.

I know so well what can be done with gold foil when used as it was when the art of making foil fillings reached high-water mark, twenty-five or thirty years ago, that I am not quick to abandon that method in medium-sized cavities. In fact I go even farther, and still fill many large cavities on the approximal surfaces of bicuspids and molars in the old way, and thus avoid so much cutting of the teeth. I had rather take a little more trouble and put in a gold filling that I know will stay, than to put in a gold inlay that may, and sometimes does, come out.

Yet I am so impressed with the inlay system that I do insert many inlays when the cavities are small and when I can open them on the grinding surface and so dovetail them that the inlay cannot come out, except as it went in—and that is not likely to occur with the force of mastication and the cement keeping it

in. But when the cavities are large and the walls frail, I believe sectional inlays make the best fillings yet known, since, as must be evident to all, they require no more cutting than do gold or amalgam fillings.

An opening into a cavity large enough to allow of filling with gold or amalgam will be large enough to receive an inlay at least half the size of the cavity, and as this can always be placed on the buccal side, it secures that side against caries and discoloration. In this way, in teeth so badly decayed that the fillings will show, porcelain can be used and the appearance restored, because the danger of breaking in mastication arising from the brittleness of the material is eliminated, inasmuch as the gold or amalgam used to key-in the inlay can always be made to reach and cover the grinding surface border.

CEMENT AND GOLD OR AMALGAM VENEER FILLING COMBINED.

Doubtless it will be asked, Why should not these large cavities be filled with zinc oxyphosphate and then covered with a thin gold or amalgam filling, which would act as a veneer and keep the filling from wearing and dissolving away? This has been my practice since the days when zinc oxychlorid was used as a filling material. To be exact, I will make a short quotation from an article of mine on the subject of making gold fillings, published in the DENTAL COSMOS for June 1871—thirty-nine years ago. In writing of similar cavities, I then said: "Such cavities I excavate thoroughly and fill with oxychlorid—more recently with Guillois' cement. After it has set I cut portions of it away, shaping the cavity as if decay had never gone beyond its margins, and fill with adhesive gold, packed as before described, with straight instruments and the mallet. . . . If oxychlorid can be left in a cavity where it has been put as a capping for an exposed pulp, why may it not be left in any part of any cavity where a straight plugger will not reach?"

CEMENT AND GOLD PLATE MATRIX FILLING COMBINED.

This was before the days of zinc oxyphosphate. When that filling came into use the same reasoning held, and I followed that practice until a few years ago, when I hit upon the idea of using gold plate wrapped around the tooth and covering the margins of the cavity, as a permanent matrix for the cement. It was held in place by a headed pin soldered fast to it and embedded in the cement, the grinding surface being covered with a gold or amalgam filling. This inclosed the cement completely and prevented any waste of its substance. I described this method before the New York Odontological Society, and was about to publish it, when fortunately I discovered that Dr. Litch had already described it in his contribution to the "American System of Dentistry." It was a clear case of two persons independently discovering the same method. As Dr. Litch was several years ahead of me, I thought it would be in poor taste to publish that method; besides, it was not to my credit to have been so unfamiliar with the literature of our profession as to have had no knowledge of it! Until hitting upon the idea of sectional inlay filling, I used that method with great success, and I still have a large number of once badly carious teeth that are being well saved by it.

I have, however, had such good success with these sectional inlays that the two methods I have described are now practically superseded by them. There were two weak points in the system of veneer fillings I have described. They were generally not anchored deeply enough to possess great strength against hard mastication, and they were difficult to make. A gold filling, in order to stand twenty or thirty years of hard service must have considerable thickness and body, and be firmly anchored. The weak point of the gold plate matrices was the difficulty in always making a lasting edge where the gold overlapped the tooth around the margins of the cavity.

ADVANTAGES OF SECTIONAL INLAYS.

These weaknesses are overcome by sectional inlay fillings. They are certainly strong, and they can be finished to a fine edge.

Their usefulness is not by any means confined to the approximal surfaces of the teeth. They can be made in any large cavity in any part of the mouth. To key-in a porcelain or gold inlay with a gold or amalgam filling is to fix it against all chance of coming out. By proper shaping of the cavity and proper construction the inlay can be as securely fixed as any filling that has been dovetailed in.

CAUSES OF FAILURES IN GOLD INLAYS.

This matter of absolute security of fillings is a very important one. It is useless to contend that all inlays can be expected to stay indefinitely. I have had occasion to replace so many of my own, and so many made by the hands of other operators, that I am sure we have been too hopeful and too confident. If we can strengthen this weak point of our present practice we shall show that we are wise, and that we deserve the confidence of our patients. There is nothing that shakes the confidence of patients like paying a big price for an operation that has soon to be done over. One of my patients said she did not want an inlay inserted that could some day come out and be swallowed.

Another weak point of the inlays is shown in the defective edges in many of the large ones that have been in the mouth only a few years. This defect is due to the washing-out of the cement where the margins have not been properly burnished. There will be a large crop of failures during the next few years from this source. These failures may not come from the hands of men who are scrupulously careful, but from those who work rapidly and carelessly, and from those who have not yet had experience enough to realize how exacting the conditions are in the human mouth. Judging by the work that I see from time to time, many of our young men are skating over thin ice without realizing in what great danger they are of breaking through.

It is not pleasant to say these things, but I should be doing less than my duty if I did not mention them. The practice of inserting gold inlays has gone like wildfire around the world, and it is only natural to expect that there will be failures. Such a result always follows every new departure.

ADVANTAGE OF THE OLD METHODS.

Gold filling. The danger which in my opinion is involved in this radical practice leads me to urge the profession to still fill many teeth in the old way, or, if inlays are used, to put them in so that they cannot come out. In contrast to this rapid modern method I am tempted to show a gold filling that I put in a molar more than thirty-eight years ago. It was done for a cousin of mine, and no charge was made, so that I have no book record, but I can fix the date, because I know it was done when I had an office in Yonkers. It did good service until within a month, when the tooth broke off. The filling looks as if it might as well have lasted one hundred years more.

Amalgam. This tooth is also interesting as having on its approximal side an amalgam filling that may have been in even longer. I have no recollection of putting it in, and I do not believe I did, for I could not have been guilty of giving it such a bad form as it has! We often see shabby old amalgam fillings that would be a disgrace if they were not preserving the teeth so well. It is for this saving quality that I respect amalgam, much as I hate its unsightly color.

Zinc oxyphosphate with porcelain or gold veneer. I am not unmindful of the fact that in very large cavities on the approximal surfaces of bicuspids and molars a compromise can be made, and the severe cutting avoided by preparing the cavities carefully, filling them with zinc oxyphosphate, and then cutting into this cement filling and making a cavity that will receive a gold or porcelain inlay

that shall serve as a veneer. I have used this method repeatedly, and have sometimes secured a good result, but it does not make a strong filling and it is not easy to cover the largest diameter of the cavity on the approximal side without cutting down from the grinding surface. If such fillings can be extended to the grinding surface and anchored there in good-sized pits made in the fissures, very durable fillings can be obtained.

Of course, all large inlays put in from the grinding surfaces are rather helped to their places by the force of mastication, and this is their salvation in many cases. Wonderful restorations of the shapes of the teeth can be obtained by making use of these retaining points made in the fissures on the grinding surface. Many times this can be done in such a way that sectional inlays will not be needed.

Separators. Thirty-three years ago this month in this city before this society I read a paper on "The Management of Proximate Surfaces of Bicuspids and Molars." In that paper I described my separators. I little dreamed then that they would ever be used for facilitating the insertion of gold or porcelain inlays! They are very useful for that purpose, particularly between the incisors.

Priority of the advocacy of extension for prevention. In that paper I also described very clearly and very fully the practice which has since been called "extension for prevention." I did not use that term, but I described the principle clearly and completely. Many of you may be surprised at this statement, but if you will refer to the DENTAL COSMOS for May 1879 you will find that article on page 242. During these later years, when so much has been said about "extension for prevention," it has been curious to note that the profession has not observed, or has forgotten, that every essential detail of this practice was described in my paper read before this society in 1877. I did not describe a method as extreme as some have since advocated, but it was a method that secured free edges for approximal fillings, and that was enough to make them safe indefinitely. Moreover, this method was applied without the cruel cutting which is so common at the present day, but in a measure by lapping the gold over the beveled edges of the cavity.

The lapping of gold over the cavity margins. This lapping over can now be secured to perfection in gold inlays. The edges of an inlay can be made very thin, and can be lapped over the beveled edge of a cavity with the certainty that the inlay will stay where it has been placed. The edges of gold fillings could not be made so thin, and for this, if for no other reason, the gold inlay is a great advance.

In addition to extending and beveling the margins of approximal cavities in the cervical region, where only a very thin layer of gold is needed to save the tooth, all buccal cavities can be treated in the same way to great advantage. The edges of any small or medium-sized cavity on any buccal surface can be beveled and a gold inlay can be made with thin edges that will cover, if necessary, almost the whole buccal surface, without any more cutting being needed than for removing the carious portions and for shaping the cavity properly for holding the inlay. Such cases are fine examples of "extension for prevention," minus extensive cutting. The softened surfaces along the border of the gums can be treated efficiently in this way. In fact, even sound enamel can be covered in this way with thin plates of gold that will be a perfect protection to all the surface thus covered. The buccal surfaces of upper molars in children can be successfully protected in this way.

CONCLUSIONS.

To sum up, lest I may be misunderstood, let me state again that I believe that sectional inlays, while not called for in the majority of cases, can yet be made to be of great service in our practice. I have gone far enough with them to be unshaken in my belief in them within certain limitations.

Dental practice must ever be in a state of transition. To give up the old in

order to adopt the new is one of the conditions of progress. But the old remains, if founded on the fundamental and unchanging laws of nature. The perplexities that arise in deciding between the old and the new can be lessened by remembering St. Paul's advice, "Hold fast to that which is good."

I do not believe with some that the days of the gold foil filling are numbered. I think the thirty-eight-year-old filling I have shown proves otherwise. But the gold and porcelain inlays have come to stay—and, under certain conditions, I think they will stay longer when made in sectional form.

A NEW ERA IN DENTAL EDUCATIONAL STANDARDS.

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(Paper prepared to be read before the Stomatological Section of the American Medical Association, but not read in the section.)

IN considering the subject of dental education, we find ourselves confronted with the almost impossible task of adding much, if any, to the vast amount of literature that has already been contributed to this subject, until we arrive at the stage of the practical application of our ideas, and the object of this paper is to stimulate concerted action on the part of our members on this one phase of the subject.

The status of our profession today from the standpoint of its membership reminds us very much of the dark ages, when one faction looked covetously upon the possessions of the other. The faculty position of one, or membership on the state board of examiners of another, is made the target for assault of many who are ignorant of what either is doing, or the motives that prompt their actions. That there is something fundamentally wrong with our educational system, however, cannot be denied, and from the standpoint of a college faculty member, and therefore one who should be privileged to criticize because of a long study of conditions, I hope to place some of our weaknesses before you.

Our professional and even national pride at times is aroused because of the tirades we read on our dental educational institutions in general, and because of the criticism of our standards by foreign nations—and justly so; yet very few words of commendation do we hear for those institutions whose faculties have striven hard and unselfishly to correct the evils that are now oppressing our profession. Such references as "Barnacles on—" and the "Rip Van Winkles of Dental Schools" do not tend to augment this pride, nor are they very palatable to the educational and ethical ideals of those charged with the affairs of the better schools of our country; they are rather discouraging to the continuation of worthy efforts, unless such criticism is directly applied. I think it but just to add that if there are some who are willing to undertake the lead for better standards, it should be our desire and duty to lend our support, as it is by no means a simple undertaking.

We hear bitter complaints that the dentist has no social standing because of the low intellectual caliber of his profession; so a medical degree oftentimes rather than a medical education, is sought to supply the lacking prestige, and when we hear a dentist deplore the fact of his having selected dentistry as

a profession, that it is not good enough for him, we can usually trace it to the fact that he is not educated up to it, or is otherwise deficient, and does not recognize its merits. It has come to my attention that a certain state has passed laws compelling dentists to have a medical degree. Supposing a medical education is gotten with this medical degree, what has been accomplished? Only the education of doctors of medicine, not of dentistry. In such cases we will soon find schools established for mechanical training, and dentistry again relegated to its primeval status in that state, and considered only from its mechanical aspect.

No one will deny that our profession possesses an important mechanical phase, and this fact must not be lost sight of. While it may be a most important factor today, the advancement of the last few years justifies the belief that we must look forward to mechanics being given a secondary place, and that we should work with this end in view. The prevention rather than the cure of decay and other oral lesions should be our aim. The dentist better than anyone else should be educated to read the oral index of constitutional conditions, and intelligently treat all oral surgical lesions. In one respect, because of his superior mechanical technique, he is better equipped to do so than his medical *confrère,* particularly since we add to this a proper training in the various branches of the sciences of biology, chemistry, etc., all of which belong to the education of the dentist, as well as of the medical man. By training our recruits along these lines to enter the field of research and preventive medicine, we reach the zenith of our professional ambition, as evidenced in intellectual and social standing. However, it is a fitting tribute to high intellectual attainments that it impels one to higher and more noble ambitions than social standing. Where can such ambitions manifest themselves more strongly for good than in a proper appreciation and practice of our profession, dedicated as it is to the welfare of all mankind?

The foregoing represents simply a broad expression of the possibilities of a proper dental education as applied in some of our better schools, where the educational factor is paramount and all other considerations are of minor importance, but it must not be lost sight of that the reverse of this condition is practiced in many of our so-called dental schools.

The great majority of successful practitioners today are the students, the post-graduate and not ante-graduate students, and as we scan the vast field of our operations even these are comparatively few, though under the existing system of training for our profession there is little wonder at this condition. Given commercialism and financial gain as the goal to be attained, it encourages haste in getting into and through our schools, at the expense of education. Financial success, to a greater or less degree perched upon the shoulders of our new graduates, discourages a continuation of studies so poorly begun; consequently it is eminently more fitting in such a calling as dentistry that we should compel a young man to become a student before he takes up the study of his profession, rather than to trust to his doing so after he has finished. In pursuance of such a procedure, a sufficiently high and logical course of training, whatever it may be, should be prescribed for all matriculants into dental schools, that they may comprehend and pursue the work before them.

This condition will not and cannot be accomplished universally until some of our schools have been divested of their commercial aspect, for so long as schools exist that depend upon student enrolment for their support, and that enter into competition on this basis with other schools, will these low preliminary qualifications and other inducements be continued. With many the fight for the maintenance of a school means a fight for the protection of personal property, and education is only incidental to this. It is quite evident, therefore, that dental education, embracing as it does the higher branches of science, should be controlled by the higher institution of learning,

such as our state and endowed universities, where properly qualified teachers are provided. We must bear in mind, however, in this connection, that even many of these institutions go astray in the application of their privileges, as some merely lend their names to schools to strengthen them in their financial competition, and should be considered as much at fault and as disgraceful in their conduct as the school which seeks such affiliation. For our purpose, therefore, we should only seek support from such universities as are themselves properly standardized.

It is to be presumed that persons charged with the appointment of dental faculties select men because of their qualifications to teach and examine in dentistry, or because of their ability to fit themselves through special study, and by virtue of their moral standing. It is proper that such should be the case, but we find our colleges themselves, through the medium of a college association, and also the laws in many states, so depreciating the moral and intellectual standing of college faculties as to refuse them eligibility on examining boards, the very place under the present existing circumstances where educated, honest men are needed most. If the welfare of our colleges rather than the profession is to be considered, such a ruling or such a law would be of great benefit, as it would prevent many faculty members of our boards discriminating unjustly against other than their own schools; but on the other hand, it certainly deprives such states of the privilege of appointing on their boards men who should be best qualified to act. This all-important element in our educational system is left to a political selection, in many instances falling to men totally unfit to assume such a responsibility, either morally, socially, or educationally.

I ask those here who are connected with dental schools and who advocate the highest ideals for their profession, if at times they do not feel the sting of humiliation at having their teachings thus subjected to this police surveillance, particularly when a board's own moral and ethical standing may be judged by that of some of the schools which it indorses. Perhaps such indorsement may be due to a lack of moral courage. I ask again, if for the welfare of their profession they would not rather vest this power of setting the educational standards in the great universities of set, recognized standards, both state and endowed, where it rests solely in the hands of educators concerned purely in the intellectual advancement of its students—in universities where each integral part or college is compelled to keep up to the standard adopted by the parent institution; in universities where the people of a state have a right to demand an investigation of its affairs should any discrepancy arise, and in institutions whose sole success depends upon the intellectual attainments of those that pass through their portals, and upon their educational rather than their commercial competition with other schools. This can only be done upon a basis of proper endowment, and it is your duty and mine to see that our universities are thus properly endowed for this purpose.

You condemn your dental schools, yet probably few of you know of the untiring energy that many of your college faculties have exerted to have your universities take up the subject of dental education, with proper state support or other endowment, thus giving the profession its due recognition. You forget that opposed to this standard are arrayed the commercial dental schools, and what is of equally as great importance, the indifference of the profession generally. If we desire that the properly standardized universities in our country control our dental educational institutions, it can only be accomplished universally through the activity of the members of our profession, and not alone by a few interested college faculties. There must first be shown a need for such standards before such control can be acquired.

A paper on dental education is of but little value if given but a passing notice, and all the writings in the world on this subject would be of but little value unless they aroused your professional and

moral pride to an active denunciation of the obstacles besetting the welfare of our standards, or to an indorsement of the efforts to improve them—and a continued period of inactivity on your part would certainly be a poor reward to this great medical association which has honored you with the privilege of membership in it. When our profession, through this branch of the American Medical Association and the National Dental Association, has taken this step and pursues it actively, then and no sooner will begin a "New Era in Dental Educational Standards," and as time progresses the scorn in which we hold many of our schools will be dispelled. We will find in the Commissioner of Education at Washington a hearty supporter of our cause, ready to work with us for the recognition of a national standard for our land, and to help to establish a foreign recognition of the same—so we have no excuse for further procrastination in this matter.

In accepting your invitation to present a paper before this body, I chose this subject as one of most grave importance at the present time, and only in the hope of bringing some of our faults to your attention, thereby establishing an active campaign for the investigation of the same, and to incite a united effort to remove them. Failing to accomplish this, I should consider your time and mine uselessly expended.

Recommending that such a campaign be launched and that we indelibly place our stamp of approval where it belongs, it will first be necessary to analyze the various factors responsible for these conditions. Accordingly, the first to consider, in my opinion, are the colleges themselves, they being the portals of entry into our profession. Their great weakness lies in the fact that most of them are self-supporting, which means that their success rests in their student enrolment and the successful operation of their infirmary, and here originates their commercial basis, which must be considered by them before any other factor—hence on this basis the standards of our schools differ according as they have few or many students. Such means of standardization lead to all manner of methods for keeping the treasury full. These include low preliminary qualifications, unethical advertising, misrepresentation of facts, etc., as an attraction to the unsuspecting candidate, and it is a safe venture to say that where an applicant is refused entry into our profession through one school, he finds the doors of another wide open, in consideration of a proper fee. There are, of course, many reasons why men seek membership in college faculties, such as professional exaltation, financial gain, opportunity for intellectual advancement—all very proper if used honestly, but they are minor factors in their relationship to educational standards, the one great obstacle being the financial standing of the school, and competition with other schools on this basis rather than on an educational one.

This condition naturally leads to the establishment of the second mishap that has befallen our profession, and which is open for our consideration and criticism. I refer to the boards of dental examiners. In the first place it exposes our educational system to the ridicule of the whole world, that the pride of our nation, the great universities of America, in their own states, are so doubtful morally and educationally that their graduates must again be subjected to an examination by such commissions. If college faculties were properly qualified and otherwise controlled by standardized universities, then dental boards, politically appointed, would at best be an inferior body to pass on the qualifications of men and women entering our profession. However, admitting the justice or propriety of such a course, we still are confronted by the fact that while the condition of our schools may have necessitated the appointments of these boards, these very boards in return accept a school guarantee as to the moral and general intellectual status of the applicants that come before them for examination. The laws of many states specifically set forth that all applicants for a license must be graduates of a repu-

table school, and many schools are considered reputable regardless of their worthiness for such a rating. Even were schools properly inspected by boards appointed, as most of them are, through political preferment rather than tested qualifications, what guaranteed basis of standardization have they adopted throughout the country that will lead to an adequate national standard? The different boards are so singularly isolated that I know of no such standard, or if one exists under these conditions, it must necessarily vary in accordance with the mental caliber of each newly appointed board from one administration to another. If boards accept the moral and scholastic preliminary status of their applicants from the college faculties, why not their dental educational status also, or, on the other hand, why should not the entire standing of the applicants for a license be under the control of the boards or the college faculty? A conscientious college faculty, after two or three years of close acquaintance with a student's record, will finally examine him, and many times even then question his fitness to assume the responsibilities of his profession. A board of examiners, with the guarantee of a college faculty as to the students' moral characters and preliminary educational qualifications, will pass two or three times the number of applicants in one or two weeks without any previous acquaintance with them. This I consider an absolutely impossible task if thoroughly done. It is an injustice to the board itself, to the applicant, and to the public.

The National Association of Dental Faculties, the third factor in the matter of our standards, deserves our especial consideration, as it is the first organization established in this country to promote the interests of dental education, and I believe for many years did its work well. We are especially privileged to criticize its status since it has relegated to itself the power of establishing and controlling the standard of our schools with our consent, thereby establishing itself throughout the dental world as the representative of American dental educational standards. Our schools represent a state, a district, or a commonwealth, and any state board likewise. This association, however, represents our nation in dentistry, its every act reflects credit or discredit upon us as a whole, and if we as an organization sanction its conduct by our silence or indifference, we stand sponsor for it as for our representatives of educational standards. Therefore we should actively and openly condemn or approve its actions and retire from our wavering perch on the fence. If one or twenty of our members have fought their way to prominence, it should not inspire us as a profession with even the slightest degree of pride, for they are not the result of our efforts, but of their own. They are towering above their profession and the rest of us are being dragged along in their wake.

Rule 1 of the National Association of Dental Faculties, after stating what the preliminary requirements of its members shall be, states that the examination for the same shall be conducted by the state superintendent of public instruction or his appointee, but it leaves the recommendation of such an appointee to each college concerned, no matter how many colleges in the state. Why not let each college have one of its own faculty members, as it would be equally as effective? I know of cases in which one examiner in a state has refused admission where another has passed the men. It is a travesty on the standards of our profession and should be thoroughly denounced by this organization.

Rule 19 states that $150 shall be the minimum tuition fee of all members of the association. Truly a trust clause, and in no sense an educational one. It prevents one school taking students that another wants, and is most effective in its operation, making it possible for many unworthy schools to exist. Further, it is an affront to universities that choose to conduct their own internal affairs, giving an adequate education at a minimum fee, and who may desire membership in that association. It

should be the aim of such an organization as the National Association of Dental Faculties to encourage education by low fees, rather than prohibit it by high ones, and to establish non-elusive standards of preliminary qualification of an adequate nature. Abolishing these two factors alone would have a strong inhibitory action upon the continuance of many of the poorer schools that make up its membership.

For one familiar with the internal workings of our dental educational system a discussion of the subject would be without limitations, but I trust what has been said will suffice to stir this organization to an active consideration of the subject and to an open recognition or condemnation respectively of these schools that have the uplifting or tearing down of our professional standards at heart. Brotherly love and good-fellowship have nothing to do with the case, and schools which exist at the expense of our profession and its humane mission should not be allowed to continue.

The campaign for higher standards has begun. It is not a fight between two individuals, one pitting his strength against that of the other; it is an intellectual, moral, humane, and professional campaign, with the weapons all on one side; one side for and the other against high standards, with the great outside world clamoring for protection. Let us begin our work today and not tomorrow, as an organization, and appoint an active committee to investigate conditions and formulate plans. In carrying out such a work we should keep in close touch with our federal government, through the office of the Commissioner of Education, for the purpose of ultimately establishing a national standard. We should demand that our dental schools seek association with and place the control of their educational standards and other internal affairs in the hands of the higher institutions of learning, our endowed and state universities, provided they themselves are further recognized by some higher and set standard, as by the Association of American Universities or Carnegie Foundation for the Advancement of Teaching, which latter institution well deserves such evidence of our appreciation, for the valuable service it has rendered our nation in promoting the standards of its educational system—the real, true Christian foundation of our individual and national progress. Can we well afford to let this opportunity for the expression of our gratitude slip by unnoticed? Are we to be compelled to adopt a high standard for our institutions, or shall we recognize its merits and voluntarily tender our aid in acquiring it?

If the men of our profession connected with dental schools exerted one-half the energy in promoting unselfishly the welfare of their profession that they have in advancing the interests of their schools, there would be no such appeal as this made to you today. If there are any who are unwilling to work in this cause, then they should at least encourage those who are willing. The foregoing sets forth the policies of the new Dental Faculties Association of American Universities, to which any dental college is eligible to membership, provided it becomes a school of a university that holds membership in the Association of American Universities. This association guarantees the standard of the university, the university guarantees the standard of its dental school, and the dental school is thus forced to guarantee the standards of its education. This is the ideal as near as it is possible for us to acquire it in our country at the present time, and although it is progressive, it will still be found to have its defects, though reduced to a minimum, and these are much more readily corrected through the medium of the higher authorities governing the dental faculties. Shall we college men unite on this basis for the welfare of our profession and humanity, regardless of whatever personal loss it may incur? If education is the sole cause for the existence of our dental schools there should not be one dissenting voice, whether from members of our college faculties or examining boards, or other organizations, and if we refuse to

indorse high standards and permit low, inefficient standards to prevail, then it is but a poor commendation of the value of our profession, and renders it quite unworthy of receiving university consideration.

To summarize: It is clear that with our schools, fundamentally, rests the responsibility for the low educational standards of the members of our profession—with a feeble effort, and certainly lacking in courage, on the part of our dental boards and National Association of Dental Faculties to improve the conditions, and a total indifference on the part of the great body of our profession.

Good citizenship with the dentist rests very largely in the honorable discharge of his professional duties, and in the not so much individually as collectively striving to establish and maintain a national professional standard that will benefit mankind. According as a school maintains such a standard, so should it be recognized by this body. As a preliminary, and aiding the further advancement that the future will bring, a dental school council should be appointed by this body for the purpose of considering this matter, and I would recommend that the first step taken be an indorsement of the standards adopted by dental schools under university control, on the basis either of the Carnegie Foundation for the Advancement of Teaching, or of the Association of American Universities, and that such council make an annual report, thereby keeping this association in closer touch with dental educational standards and the schools of the country.

PRACTICAL DENTAL THERAPEUTICS.

By H. B. HOLMES, D.D.S., Louisville, Ky.

(Read before the Southern Branch of the National Dental Association, at Houston, Texas, May 4, 1910.)

VERILY we are living in an age of development and progression. If one wishes to spend a quiet hour in reminiscence, let him consider the advancement made in the various sciences and professions during the past decade, or let him delve farther back, and contrast professional methods and scientific principles as he first recognized them and as they appeal to him now.

The sciences and the various professions were not like Minerva, who sprang ready armed from the brain of Jupiter. They were the children of time, and have been formed insensibly by the collection of the methods pointed out by experience, and at a late day by the principles deducted from the combinations of those methods. Thus old men whose prudence caused them to be called to the bedsides of invalids, and whom compassion taught to cure wounds, were the first physicians.

The shepherds of Egypt, who observed that certain stars, after the lapse of a certain period of time, met in the heavens, were the first astronomers.

The person who first uttered in simple language the truth that 2 plus 2 equals 4 created mathematics, that mighty science which really placed man on the throne of the universe.

In the course of the last half-century, many new sciences have taken their place in the category of our knowledge, and old ones have so broadened and lengthened and taken on new coloring and dignity as to be unrecognizable as their former selves. About that time

dentistry appeared as a distinct profession, and its development along its every line has been almost phenomenal. In fact, all sister sciences have made way for it. This is, of course, but a natural result, as all sciences cultivated for a long while must advance, especially as the art of printing makes retrogression impossible.

It is true, possibly, that for awhile knowledge which had been gained was guarded as secret, confined possibly to only hired attendants. Fortunately such days are past. Not a man before me has a professional secret; in fact, the proudest man here today is he who has the most information to divulge to his professional brother. This is why our profession has made such remarkable progress and development.

EMPIRICAL VS. RATIONAL THERAPEUTICS.

"Therapeutics" has been defined as the application of drugs or remedies in the treatment of disease, and dental therapeutics differs in no way from general therapeutics, except in its limitations, being confined to the treatment of the diseases of the mouth and the adjacent structures. This, then, is our calling, our life-work, and it is of such grave importance that every one of us should be interested.

The term therapeutics has been variously subdivided; we will mention only two of those divisions. Empirical therapeutics relies upon observation rather than upon theory; this is a manner of quackery without science, or the treatment of disease conditions in a haphazard, unscientific manner. Rational therapeutics is based on reason; the rational therapeutist cares more for the cause of a disturbance of general organic functions and less for the name of it. The rationalist is not satisfied to know that certain results may be obtained by the use of certain medicines in certain diseases, but he wants to know that they *will* be obtained, and *why* such results are brought about. Have we been guilty? Are we now ever guilty of empiricism in treating the various oral diseases? If I should ask that he who is without guilt cast the first stone, not a missile would be hurled. But of this, too, I am equally sure, namely, that the tendency of dental therapeutics today is to place the treatment of disease upon a rational basis. For this we are very much indebted to Dr. J. P. Buckley of Chicago, whose work and research has been a very great factor in this direction. From him we learn that there are three essentials upon which all successful therapeutics rests: First, "to be able to recognize a pathologic condition and make a correct diagnosis"—if we fail in this, all else must of necessity be unscientific; secondly, "to know what drug or remedy, if properly administered or applied, will reach the recognized pathological condition and act most favorably"—hence the importance of our possessing a knowledge of pharmacology, which is the science of the action of drugs upon the organs, the functions, and the tissues of the body; thirdly, "that we have at hand, in a convenient and practical form, that drug or remedy which experience has taught us will assist nature in her efforts to restore a diseased condition to a normal one." Practical therapeutics may be discussed from so many viewpoints, as related to any number of abnormalities, that it is a little difficult to decide to what particular disease we should concentrate our efforts in a paper. I have decided, however, to discuss the usual rather than the unusual, the pathological condition that we meet daily rather than occasionally, and the trend of the discussion shall not be toward discoveries especially new, but rather toward the technique of administering and applying drugs which have an established scientific value. For I am fully convinced that often, when a failure in producing a therapeutic effect is experienced, it is the fault of the technique and not of the agent employed.

TREATMENT OF PUTRESCENT PULPS BY RATIONAL THERAPEUTICS.

We will consider hastily the treatment of putrescent pulps, for this is a con-

dition of daily occurrence, and one with which every practitioner should familiarize himself. It is in just such treatments that we have been most guilty of empiricism. The only way in which we can scientifically apply medicinal agents in treating the above-mentioned condition is to have some definite knowledge of the intermediate and end-products resulting from the putrefactive process.

GASES IN PUTRESCENT CONDITIONS.

Gases in putrescent conditions. In the preparation of this paper I looked up the word *putrescent* in a "Universal Dictionary of the English Language." I found there that it meant the decomposition of organic substances, and that it differed from fermentation mainly in being accompanied by the evolution of fetid and noxious gases, which the dictionary named as ammonia and hydrogen sulfid gases. Dr. Buckley in his recently published text-book makes a similar statement. In the beginning of this paper, when in speaking of scientific advancement, I should have mentioned as a notable example the chemistry of gases; who knows if the chemistry of gases will not ultimately overcome those as yet rebellious substances, mingle and combine them in proportions not as yet attempted, and thence produce substances and effects which would remove many restrictions of our powers? We have learned from sad experiences that in the process of pulp decomposition some gases are evolved which, if confined, produce severe pathological disturbances, on account of the pressure exerted, thereby forcing the infectious material through the apices of the roots into the surrounding tissue, resulting in infection, septic pericementitis, and, in many instances, alveolar abscesses. A decade ago I was taught never to hermetically seal a cavity when treating a putrescent condition. We were told to leave it open so that the gases might escape, else we might expect swelling and pain. For a long time I did not dare to seal up a putrescent canal, and every time I failed to do this I made three vital mistakes—in that the oral fluids were constantly contaminating the medicine within the tooth, the medicine was escaping into the patient's mouth, and the tooth was changing color during the process of treatment. To prevent these undesirable conditions, every putrescent tooth should be sealed with cement at the first and at every subsequent sitting.

Formaldehyd. It has been proved that these gases are present, and it now becomes necessary to dispose of them in order that we may hermetically seal the cavity. It has been shown by such men as Cassidy, Buckley, and others that formaldehyd is a valuable therapeutic agent if properly employed. This gas is dispensed in a 37 per cent. aqueous solution, which solution is recognized by the U. S. P. of 1900 as liquor formaldehyd or formalin. We are taught that the gas unites with ammonia, producing a substance, or solid, known as urotropin. It also unites with hydrogen sulfid, forming methyl alcohol, a liquid, and sulfur, a solid. It is also said to unite with the basic ptomains, forming inodorous compounds. We conclude, then, that by the use of formaldehyd the irritating gases and poisonous liquids (largely ptomains), which are the result of pulp decomposition, can be changed into non-irritating and non-poisonous liquids and solids.

Diluting agents for formaldehyd. As we all know, formaldehyd is too irritating to be used alone, and must be diluted with some other agent. For this purpose one may use cresol, phenol, or creasote. If we use either of the last two agents, however, we shall have to further dilute with a small amount of alcohol in order to clear the solution.

Cresol. Cresol is recommended as the preferable diluent, for four principal reasons: First, it is miscible with liquor formaldehyd in all proportions, thus making without the addition of alcohol a good pharmaceutical product, from which formaldehyd gas is constantly generated; second, it is of itself a good disinfectant, much more powerful than phenol; third, it possesses anodyne properties, thus modifying the irritating action

of the formaldehyd, and fourth, it has a chemical action upon the fatty compounds present in the tooth, thus disposing of them to advantage.

Specifics for dentists. Our medical brothers are fortunate in having what are known as specific remedies, or remedies which can always be relied upon to produce a therapeutic effect, such as antitoxin in diphtheria, vaccine in smallpox, quinin in malaria, etc. Why cannot we have specifics in dentistry as well? I am fully convinced that formocresol is a specific for putrescent pulps. The writer has used it for two years with universal satisfaction, and believes that whenever trouble arises, the fault lies with the operator rather than with the agent.

I would not always hermetically seal the cavity of a tooth when treating a putrescent pulp, for drugs selected merely on account of their efficiency cannot inhibit the growth or destroy the vitality of micro-organisms. But when formocresol is employed we have a remedy which chemically converts the noxious products of decomposition into substances which themselves possess antiseptic and disinfectant properties; and we not only can but should seal it in hermetically, thereby getting the full benefit of the drug and preventing discoloration by the ingress of the fluids of the mouth.

TREATMENT OF PUTRESCENT DECIDUOUS TEETH.

Another phase I would mention is that of putrescent deciduous teeth, for we now realize that their conservation is very necessary. After having gained the confidence of the little patients, which is an all-important first procedure, I have them use some pleasant-tasting antiseptic solution as a mouth-wash. As an adjunct to the formocresol remedy I use the precipitated calcium phosphate (another suggestion of Dr. Buckley's), mixing these ingredients to the consistence of a thick paste. This paste is packed into the pulp-chamber, and keeping the cavity as dry as possible, a quick-setting cement is flowed over it. It is remarkable how abscesses will heal and remain quiet—provided, of course, that no complications arise, such as caries or necrosis of the bone. If, however, a tooth is to be conserved for several years, it might be better to neutralize the putrescence with the formocresol remedy, after which the root-canals can be flooded with the Eucapercha compound.

EUCALYPTOL VS. OIL OF EUCALYPTUS.

In the filling of canals it is the practice of many dentists to moisten the canals with eucalyptol before introducing the gutta-percha cone, as this agent is known as a solvent for gutta-percha. Care must be taken here to use eucalyptol, and not oil of eucalyptus, as this oil is highly irritating, and has been the cause of many cases of acute apical pericementitis. The writer had this experience once, when it became necessary to extract the tooth on account of the severe pain.

The property of eucalyptol may be modified and its antiseptic value enhanced by adding menthol and thymol, Buckley's prescription being—Mentholis gr. ij, thymolis gr. iij, to a fluidounce of eucalyptol. This is known as the eucalyptol compound, and while less irritating, is equally as good a solvent for gutta-percha as eucalyptol or oil of eucalyptus.

IMPORTANCE OF PROPER ROOT-CANAL FILLING.

There are so many different methods of filling root-canals that one hesitates to discuss this operation, which is of extreme importance, and if carelessly done, may result in severe pericementitis. There is possibly more pericementitis produced by root-canal fillings than by any other mechanical irritant. In filling canals we should be absolutely certain that the canal is aseptic. If there is any doubt as to its aseptic condition it must not be filled. If there was ever an illustration of "haste making waste," it is here. In order that the color of the tooth may be retained as much as possible it must be kept perfectly dry. In filling

canals. following the treatment of an alveolar abscess, the great danger lies in forcing materials through the apex, for there being no live tissue at the immediate end the patient can feel no pain there; but when new granulations occur and this space is filled with new tissue, it comes in contact with the foreign material which had been forced through the naturally enlarged opening, and the result is a recurrence of pericemental trouble.

THE BLEACHING OF PORCELAIN FILLINGS.

By L. E. CUSTER, A.M., D.D.S., Dayton, Ohio.

(Read before the National Dental Association, in general session, at Denver, Colo., July 19, 1910.)

TWO years ago, before the Northern Ohio Dental Society, I stated that the longer a porcelain filling lasts the worse it looks. This is due to two changes that take place in porcelain inlays. One is the chipping of the brittle margins in exposed positions, and the other is the gradual change of color of many of these fillings. This change of color is one toward a lighter shade; the porcelain appears to lose its coloring matter; in short, we may say the filling has bleached. In most cases this change of color goes on slowly, but I have seen a few instances in which the porcelain has completely bleached out in three months' time. It might be said that the discrepancy in color between tooth and porcelain does not lie in the porcelain, but in a gradual change in the color of the tooth to a darker shade, thus making the porcelain filling appear lighter by contrast. But porcelain crowns placed in the same mouth at the same time, which we know do not change color and which originally matched the teeth, stand as valuable records to show that the natural teeth have not perceptibly changed in color.

The many years' use of porcelain teeth in vulcanite, crown, and bridge work, during which time our suspicion was never aroused as to any possible change of color in properly baked porcelain, have led us to believe that porcelain used in any manner whatever in the mouth would retain its color perfectly well. It was hard to believe that a material possessing the properties of porcelain should change color in time, but the discrepancy of color which I have seen in many cases, especially in porcelain inlays, shows to an observing eye that the inlay material does change color in time. The bleaching of the color, as I have observed it, only takes place in porcelain baked in a matrix. How inlays, which were inserted over twenty years ago, still retain their original color as far as the eye can judge. This would lead us to believe that all porcelain being practically of the same basic formula, the cause lies in the working and baking of matrix-made inlays—for we must exclude any effect of the matrix material upon the change of color of the porcelain, as the bleaching takes place in the mouth, after the matrix has been removed.

The effect of light, which is the best bleaching agent, was tried, in order to ascertain whether the change of color came from this source; if not, we must return and seek the cause in the working of the material itself. Six pieces of porcelain, two of Jenkins', two of Brewster's, and two of Whites' high-fusing inlay material, were fused in the electric furnace. Of each material one specimen

was under-fused, and the other was over-fused, in order that we might at the same time see what effect, if any, the state of fusion had upon the change of color. Incidentally you will notice the effects of different degrees of heat upon the porcelain, the higher heat producing a lighter color. These slides were then broken in halves, and one-half of each placed in the dark, while the other half was exposed to the sun for four months. These pieces were readjusted for comparison, and a close inspection will show that no change of color has taken place under the sunlight test.

This test would therefore exclude light as a bleaching agent of porcelain, and we must look for the cause of the change of color in the working of the porcelain at the time of its baking, and in the effects of the conditions found in the mouth.

On looking over my records it was found that those inlays which showed the most pronounced loss of color were of the low-fusing variety, whereas those which had preserved their color best were made of porcelains the fusing-point of which was higher than that of pure gold. This aroused the suspicion that these changes take place more rapidly in over-fused than in under-fused porcelain, for while I use a special furnace for each kind, I find it a very easy matter to over-fuse the low-fusing porcelains. It might be said that when they were set in the cavity, some of these inlays were of a lighter shade than intended. The difference in shade, however, was never so great as to necessitate the casting aside of the inlay. The inlay would possibly be one shade lighter, but never four or five numbers, as I have found some of the bleached inlays to be.

It is quite noticeable that all old porcelain fillings—except those with porous surfaces, which are superficially stained —are lighter than the tooth. Admitting that the tooth has darkened somewhat in time, the difference is too marked to be attributed entirely to the change of color in the tooth. The inlays which have noticeably changed color do not appear to possess the edge strength of others, and this leads us to suspect that the porcelain has not been properly baked.

So there is only this conclusion left: That the bleaching of porcelain inlays is due largely to under- or over-fusing of the porcelain. The material comes to us in the form of finely divided powder, each granule of which possesses all the color of the completed inlay. This color can be changed during the fusing to a lighter color by high heat, or it can be even entirely bleached out by being kept for a long time in low heat. What concerns us is the cause of the change of the color after the inlay has been properly matched and set in the tooth—the change to a lighter shade and in some cases the entire loss of coloring matter as time goes on. In a properly fused inlay, the granules of porcelain have been brought to such a heat that there is a complete coalescence of all the particles into a smooth and uniform product. In an under-fused inlay, the heat has only been sufficient to bring the particles into an imperfect coalescence. We would therefore conclude that the coloring matter has not been decomposed or in any way started toward decomposition. In an over-fused inlay, however, we have, after proper coalescence, a decomposition of some of the ingredients of the porcelain which makes it porous, and at the same time the coloring ingredient has been changed to a lighter color. This decomposition and change in the coloring matter does not seem to stop when the filling has been set in the cavity, but having been started continues, owing to the conditions present in the mouth, until the inlay has lost all its coloring and has the appearance of a bleached inlay.

ORTHODONTIA.

By E. A. BOGUE, D.D.S., M.D., New York, N. Y.

(Read before the Southern Branch of the National Dental Association, at Houston, Texas, May 4, 1910.)

THIS paper is intended only as a guide-post for the younger, less experienced practitioners, who may be just starting out as orthodontists, and to whom I hope it may be of some slight assistance.

REQUIREMENTS FOR THE STUDY OF ORTHODONTIA.

Orthodontia must be learned little by little, like a foreign language.

(1) *Normal occlusion.* The operator should have a knowledge of the normal occlusion of human teeth in the adult. The most accurate description of adult occlusion, though difficult to understand, is contained in a paper by Dr. I. B. Davenport of Paris, published in the DENTAL COSMOS for July 1887. Illustrations of occlusion may be found in Angle's "Malocclusion of the Teeth," 6th edition; in Turner's "American Text-book of Prosthetic Dentistry;" also in Pullen's chapter on Orthodontia, included in Johnson's "Text-book of Operative Dentistry."

(2) *Normal arches.* He should have a knowledge of the shapes and sizes of the ideal arches in adults. A treatise on this subject will be found in Bonwill's paper in the "American System of Dentistry," page 406, vol. ii, and in a paper by Dr. C. A. Hawley on "The Determination of the Normal Arch, and its Application to Orthodontia," published in the DENTAL COSMOS for May 1905.

(3) *Irregularities of the deciduous teeth.* He should have an idea of the positions and occlusion of the deciduous teeth at four years of age. Dr. Pullen's paper in Johnson's "Operative Dentistry" furnishes a few illustrations. Dr. Varney E. Barnes' paper on "The Evidence and Significance of Tooth Eruption," published in *Items of Interest* for September 1909, and a few more occasional articles published in dental journals furnish some others, but so far as I know, extensive illustrations of the positions of both normal and abnormal deciduous teeth are lacking. Something is to be learned by observation of the various children that may be accessible. The correction of impending irregularities by means of the deciduous teeth when the child is not more than five or six years of age is the most important factor in modern orthodontia.

It may not be generally realized that the deciduous teeth, at about the fifth year, bear marks of irregularities, if any exist among them, just as distinctly as the permanent teeth. If it is recognized that there is not room for the permanent teeth to erupt regularly, the temporary arches may be broadened sufficiently to admit of such regular eruption; and as they are broadened, the upper molars, having three roots, holding in their midst the crypts of the permanent bicuspids, carry with them these permanent crowns, that have as yet no roots, to the place designed by nature for them to erupt in.

The six anterior teeth and their sockets will then be spread apart and pushed forward, and the arches be enlarged by the operation of the tongue. This process operates to prevent not only many of the irregularities prevalent among the per-

manent teeth, but irregularities in the nasal cavity and in the parts beyond, and has an important influence upon the cranial development of the child.

(4) *Eruption of the permanent teeth.* Before beginning any orthodontic work the operator should have a clear idea of the changes that should take place in the deciduous dentures at the fifth, sixth, seventh, eighth, and tenth years of age, and of the changes among the permanent teeth at those ages, both in normal and abnormal conditions. This knowledge serves to guide the operator in managing the eruption of the permanent teeth so as to *prevent* irregularity.

The most important teeth in the permanent set are the first permanent or principal molars, which appear while the deciduous teeth are still in the mouth, at about the sixth year of the child's life. The lower principal molars have five cusps, and no other teeth in the human mouth have that number. The extra or fifth cusp on each lower molar stands forward of the upper molar when the teeth are closed, and makes up for the difference in width between the upper and lower incisors, so that with this cusp closing in front of the upper molar, there is just enough tooth substance to form the perfect lower arch with the four narrow lower incisors occluding beneath and inside the arch of the upper teeth. The upper first molar, therefore, sits astride the buccal row of cusps of the lower first molar, just posterior to, and nicely fitting in with the anterior buccal cusp of the lower first molar. When this arrangement is perfectly understood, as well as the manner in which the various cusps of the teeth occlude with their corresponding sulci or depressions in the antagonizing teeth, one has the groundwork of orthodontia, and not until then. When one understands the changes that take place in the deciduous teeth of a healthy normal child at about five years of age, it is seen that the deciduous incisors and canines should normally spread apart at that age, and thus give room for the eruption of the larger permanent teeth, which lie immediately behind them, above or below, as the case may be. If they do not thus spread apart and make room, it is the province of the skilful dentist who is caring for these children to place upon the deciduous molars light bands with lingual wires, and small vertical tubes fitted to carry an 18-gage arch wire as directed by Dr. Ainsworth (see *International Dental Journal* for July 1904), and to spread these arches until there is room for the permanent teeth to erupt. The fixtures can be allowed to remain a year or two, if necessary, and the regular eruption of the permanent teeth will be greatly facilitated thereby, and all this at very slight cost of money, time, or pain to the patient or his family.

(5) *Means of regulating teeth.* The operator should have an idea of the best means of applying force to irregularly placed teeth to induct them into the places they should occupy.

(6) *Grave consequences of faulty regulation.* He should apprehend the injury that supervenes when any error is made in applying that force, either in the method of application, the amount of force employed, or the time of its application as regards age or condition of the patient.

(7) *Retention.* He should learn what the forces are that retain normal teeth in their normal positions; then learn how, by utilizing the shapes and forms of the teeth, to retain them with the least possible injury in the new positions to which they may have been brought. (See Dr. F. L. Stanton's article on "The Teeth in Respiration" in the *Dental Digest* for April 1910.)

(8) *Certainty of aim.* He should know what he wishes to accomplish and then do it—not do at it.

(9) *Necessity for preliminary treatment of the teeth.* Finally, the operator should make sure that every cavity or defective spot in the enamel of every tooth is carefully and accurately filled or otherwise protected before any appliances are placed upon the teeth. In cases of superficial caries at the gingival margins, especially on deciduous teeth, the writer has found the application of silver nitrate effectual. Other-

wise the accusation may justly be brought that the regulation of the teeth has worked more injury than benefit; and he should never extract a permanent tooth in a child no matter what the deformity, involving the teeth only—or it may be his misfortune to have such a letter as the following written about his work. This letter came to me years after I had lost sight of the patient:

"BOSTON, MASS., July 30, 1908.

Dear Dr. Bogue,—Almost fifteen years ago I came to you in regard to my teeth. I had a very narrow arch, and the teeth were irregular and protruding, and my articulation was very indistinct.

After being with you for a year or two, my arch was very much broadened; then I was obliged to move to a western city, and under your direction was treated by a dentist in that city. I was under his care for almost two years, and in that time he extracted two teeth.

Now I find the arch is getting narrow—in fact, almost as it was in the beginning, with the exception of the protruding and irregularity. As the arch grows narrow the articulation becomes more indistinct.

I write you this letter thinking you might be interested in the final outcome of the case.

Respectfully yours,

D. F. B.

To which I replied as follows:

July 31, 1908.

My dear Mrs. B.,—I am more grateful than I care to express for your letter received this morning.

As a little girl I took a very deep interest in your case and earnestly strove to correct the difficulty.

When you went away, naturally I could not direct how the treatment should be further conducted.

The extraction that was resorted to was, as you know, against my wishes and against my judgment.

Your case has been published to show how wrong I was in desiring to save all your teeth!—hence you may imagine how pleased I am that you should have written what fully sustains my view, and will perhaps save some other unfortunate from a similar mutilation.

We all learn as time goes by, and I think the gentleman who treated you is by this time convinced that I was right in desiring to give you the fullest width allowed by preserving all the teeth.

Sincerely yours,

E. A. BOGUE.

CONCLUSION.

To sum it all up, unless the operator can see the end from the beginning, and have the work clearly formulated, at least mentally, he had better spend more time in studying his case before he does anything, and so avoid the necessity of doing the same work twice.

OXYPHOSPHATE CEMENTS.

By Dr. C. M. McCAULEY, Merkel, Texas.

(Read before the Southern Branch of the N. D. A., Houston, Texas, May 4, 1910.)

THE field of application of oxyphosphate cements has been increasing from time to time since their first introduction. They have been rapidly growing in favor, and since the advent of the cast gold inlay, they have become quite indispensable. On account of the almost universal use of some of the phosphates in cases where an adhesive cement is required, this paper will be devoted entirely to this class of cements. The importance of this material to every practitioner of dentistry is more forcibly impressed as one considers the matter carefully from the standpoint of utility. We hardly realize its full import

until we have enumerated the vast number of operations in which a cement is used, and realize that in each operation the quality of the cement means so much in the matter of service and satisfaction to the patient and gratification to the operator.

TESTS FOR THE SELECTION OF CEMENTS.

The purpose of this paper is not to try to advance any new ideas in cement manufacture or production, but to remind you of some of the vital points you once knew and have forgotten, to give you the results of some investigations in the form of practical tests made by the author, and to impress you with the importance of ascertaining for yourself whether your favorite cement is really the best. Quality means much in the outcome of every operation in which cement plays a part. Practical tests are easily made in your own office. Porosity, expansion, and contraction are among the most important features distinguishing the good from the bad in the cement market. You think you are using the cement which produces the best results in your hands, but do you know it? The avoidance of the embarrassment consequent to one failure due to an inferior cement is sufficient compensation for the time and expense required to make your own tests.

Cements differ in composition in elements and proportions. These differences require different manipulations. Your style of manipulation might be more suited to one brand of cement than another. The accompanying tests were carefully made by the author, and in each case the cement was manipulated as nearly as possible according to the directions inclosed in the package. The results are not favorable to the brand of cement with which the writer has had most experience in his practice.

CREDIT DUE TO THE MANUFACTURER OF CEMENTS.

The increasing demand of recent years for a good cement has stimulated the manufacturer to strive for perfection in his product. Only to a limited extent has he realized the end toward which he is working; perfection has not yet been attained. He has traveled a long and rocky path, bordered by many failures and discouragements, and has only reached the point where in the dim distance he can catch an occasional glimpse of light radiating from the goal toward which he is striving. We should be ungrateful were we to censure him for not having reached this goal already, when, in my opinion, he has earned our gratitude in reaching the heights which he has now attained toward the pinnacle of cement manufacture. I dare say the manufacturer has done his part in the production of cements equally as well as the dentist has performed his work in the study of their nature, composition, and manipulation.

NECESSITY OF PROPER MANIPULATION.

Not only would a universal study of the merits of the different cements stimulate an improvement in the quality of the material, but it would also improve the skill of the operator in its proper manipulation. A vast deal depends upon the manner in which the spatula and slab are used. An inferior cement well mixed is more dependable than a good cement poorly mixed. The importance of correct manipulation and the fact that this cannot be so well attained without some knowledge of the ingredients entering into this chemical compound, impels us to briefly review these points.

CHEMICAL CONSTITUTION OF CEMENT.

The ingredients of cement before mixing are a powder of zinc oxid and a liquid of phosphoric acid, both in their unmodified form. After mixing these two, we have a new chemical compound which contains zinc oxid and zinc phosphate, hence the name—zinc oxyphosphate. The amount of acid used is not sufficient to dissolve all the zinc oxid, so an excess of zinc oxid granules is left which acts as a base for the oxy-

phosphate compound, and the zinc phosphate formed by bringing the powder and liquid together acts as a cementing medium, which holds together the excess of zinc oxid granules contained in the powder. Hence we have zinc oxid for the body of the cement, or enamel-rod substance, so to speak, and the zinc phosphate for the cement substance. The quality of enamel depends not upon the enamel rod but upon the cement substance, so also the quality of a cement does not depend so much upon the zinc oxid as upon the quality of its cement substance, viz, zinc phosphate. Zinc oxid is insoluble in the fluids of the mouth. If the cement substance which holds its granules together is insoluble, the result is insolubility.

THE CEMENT LIQUID.

Pure phosphoric acid and pure zinc oxid unmodified are not used in the commercial cements on account of their harsh-working and quick-setting qualities, and moreover from the fact that different colors are desired. Smooth working and slow setting are obtained in some cements by using glacial phosphoric acid in solution for the liquid. Such a cement is of an inferior quality, for the following reason: The zinc oxid granules are held together by the double phosphate of zinc and sodium, the glacial phosphoric acid being pure phosphoric acid, with uncertain amounts of sodium phosphate added to give it the glassy form for commercial purposes. This cement substance is porous and unstable; it naturally follows that the cement will be of a porous nature. If the liquid is modified with the phosphate of some of the non-alkaline metals, such as copper, magnesium, aluminum, or silver, the desired working and setting qualities are obtained and the quality of the cement is not impaired.

THE COLORING AGENTS.

Likewise different colors in the powder may be produced with materials which do not detract from the good qualities of the formula. Formerly pigments were produced by the use of such materials as calcium oxid, silica, and alumina, all of which are inert or even detrimental to the combination. It has been found more beneficial to use a substance for pigmenting which will form a cement when treated with phosphoric acid. Such metals as gold, silver, copper, and mercury, in the form of their oxids, will furnish all the necessary shades, and at the same time will form a cement when treated with phosphoric acid in the same manner as will the zinc oxid. The inevitable conclusion seems to be, if the foregoing statements are correct, that the better cements possess such modifications as the phosphates of non-alkaline metals in the liquid and the oxid of the cement-forming metals for producing the desired shades.

FACTORS DETERMINING THE PROPER SELECTION OF CEMENTS.

If we would be successful in the selection of a good cement we should avoid the following properties, namely, solubility and porosity, marked expansion or contraction, and weakness.

Solubility. For inlay purposes possibly solubility and porosity should be most avoided. Good strength is very desirable, yet we should never depend upon the cement to hold the inlay in place. The successful, lasting inlay is the one which is held in position by the shape of the cavity. We have great faith in the gold inlay placed in such a cavity and cemented with an insoluble and non-porous cement.

Porosity. Porosity is caused by crystallization toward many centers, leaving an innumerable number of small spaces in the mass. Shrinkage occurs when the mass crystallizes toward one center only. Porous cements never shrink in setting. Cements which shrink in any marked degree are non-porous.

Expansion and contraction. Expansion in cements is caused by taking in water of crystallization during the set-

ting process, thus increasing the mass. Contraction is caused by giving off residual water during the hardening process, reducing the volume. Expansion may be prevented by adding water to the formula to satisfy the demands of the crystallizing process; contraction may be prevented by depriving the formula of its surplus water. Thus a perfectly balanced formula, as regards expansion and contraction, may be had by supplying the formula with the proper amount of water. This perfectly balanced formula has been found to set too rapidly for practical purposes. It has proved more satisfactory to deprive this formula of a certain amount of its water in order to enhance its working qualities, and allow the mass to take up some water during the setting process to supply the demands of crystallization. A cement of this kind must not be kept dry while hardening, but must be subjected either to the fluids of the mouth or water. A cement of this kind is called hydraulic or submarine.

Strength. Strength of a cement depends upon the modifying elements in the liquid and the size of the granules in the powder. The finer grain powders show more strength than the coarser.

Adhesion. Adhesive properties are governed by the shape of the crystals as regards the irregularities of the surfaces to be cemented. If the crystals are so formed as to permit their knitting into the minute recesses of the surfaces cemented, other qualities being good, we have the maximum degree of adhesion.

Setting. Setting is hastened by the addition of water to the liquid, the presence of heat, or by the fine grain of the powder. Setting is retarded by the addition of phosphates to the liquid and by absence of water and heat. A given cement will set more slowly in a cold or dry atmosphere than in warm or moist surroundings.

Crystallization of the liquid. Crystallization of the liquid is caused by overloading the liquid with phosphates in solution to procure desirable working qualities, strength, etc. Care must be used to prevent this, as such crystallization is quite detrimental or even disastrous. When a liquid is used from the original bottle, crystallization is often set up around the cork, where it comes in contact with the air. This formation may reach the liquid in the bottle and cause material injury to the properties of the cement. The possibility of such damage may be done away with by transferring the liquid from the original bottle, upon its first being opened, to a glass-capped bottle of the style of the S. S. W. preparation bottles. It may then be transferred to the slab with a small dropper in such quantities as are needed. For practical use this is more economical and convenient than the original bottle. If you have not adopted this plan, I would heartily recommend its trial.

PROPER MIXING AN IMPORTANT REQUISITE.

Proper mixing is one of the most important points requisite for a good cement. Time should be allowed for the necessary chemical action, and cleanliness should be strictly observed. A multitude of failures are due to careless and improper mixing. With some operators a good mix is an accident; with the careful operator, who understands what he is doing, a good mix is the rule.

For example, we shall assume that the mixing is begun with pure phosphoric acid and zinc oxid, to be spatulated together. The chemical action that follows is the formation of zinc phosphate. There is never enough acid to change all the powder; if it were so, the result would be a mass of zinc phosphate, or, by comparison, the same as dental enamel would be without the enamel rods. There would be no base left to give integrity to the mass. Instead, only a part of the zinc oxid is acted upon, leaving the rest to act as a base for the cement. The zinc phosphate formed

seems to act as a cementing medium to hold these zinc-oxid granules together. The mixing, therefore, should be so performed as to have enough zinc phosphate to properly cement together the remaining unchanged granules of zinc oxid. In order to accomplish this result, the first stage of the mixing should progress slowly, allowing time for the necessary chemical action to take place. It is during the first stage that the zinc phosphate is formed.

TECHNIQUE OF MIXING.

The technique recommended by some of our best manufacturers is as follows:

Secure a large glass slab, clean and dry, and a broad spatula made of German silver. Steel is bad on account of the detrimental effect of the iron phosphate formed. Place the powder and liquid on the slab a convenient distance apart. Bring a small quantity of powder into the liquid and spatulate well, until a perfect solution is apparently formed. Allowing time at this stage assures the necessary phosphate for the cement substance. After this first addition, the work may be carried on a little faster. The rest of the mixing, up to crown and bridge or inlay consistence, should consist of from eight to ten portions of powder, each being spatulated thoroughly before bringing in the next portion. The mixture should then begin to work heavily, and when dropped from the spatula it turns loose somewhat slowly and ropes as it falls to the slab. Creamy consistence is a little thin; if it leaves the spatula in drops, it is too thin. One of the most common errors in mixing cements seems to be too thin mixing.

MIXING FOR A FILLING.

If a filling is to be made, put aside enough of the mixture at this point to line the cavity; this increases the adhesion. Continue adding the powder as before but a little faster, until the mixture becomes very stiff and works heavily under the spatula, sometimes tending to curl up behind it. The cavity should not be too dry for best adhesion. Dry well with cotton. Dispense with the hot air, as the small amount of moisture left in the tubules will help to supply the water of crystallization, which has been left out of the formula and which must be supplied during the setting process.

If an inlay or crown is to be set, moisture should be kept away only until the hardening has well begun. Then the fluids of the mouth or water should be brought in contact with the cement. Fillings should be immediately subjected to moisture after roughly shaping, and finished a little later.

CEMENT TESTS.

Tests have been carefully made in four of the leading commercial cements, namely, Fellowship, Harvard, Petroid, and Ames. In each case care was used to follow the directions accompanying the package. Ames, Fellowship, and Petroid are recommended as hydraulic cements. These three were subjected to water as soon as the setting had well begun. Harvard is not claimed to be hydraulic, so the varnish accompanying the original package was used to prevent the moisture from coming in contact with the cement. About twelve hours after the cement had been placed in a small tube and immersed in water in a bottle, red ink was placed in the small tube above the cement. These tests were begun practically sixty days ago, the mixing all being done between February 25th and March 5th. The results are very plain as to expansion; close inspection will be required to distinguish between shrinkage and porosity.

Mix No. 1 was made thin as for setting inlays, No. 2 was made thick as for fillings. The hydraulic cements, especially mix No. 2, should not be censured for some shrinkage that occurred toward the top of the test tube, as water was only allowed to come in contact at the bottom. Lack of water here would cause slight contraction.

The result as shown, comprising all the tests made, is subject to your inspection and criticism. Only five of the tubes show results which can be regarded as entirely satisfactory. All the tubes containing Ames' cement, mix No. 1, show no expansion nor contraction, and the cement is free from porosity.

CORRESPONDENCE.

DENTAL INTERNE TO BE APPOINTED AT BELLEVUE HOSPITAL.

To the Editor of the Dental Cosmos:

Sir,—The following letter from the secretary of the board of trustees of Bellevue Hospital speaks for itself. I shall be pleased to hear from any qualified young man who would like a year's hospital experience:

September 23, 1910.

Dr. Herbert L. Wheeler,
12 West 46th st., New York, N. Y.

Dear Sir,—The Trustees have, upon the recommendation of the Medical Board, resolved to appoint a dental interne at Bellevue Hospital, as suggested by you. Will you kindly recommend a competent dentist to fill the place, and advise us what steps are necessary on our part to get the place established.

Very truly yours,
F. K. Paulding,
Secretary, Board of Trustees.

The opportunity for a year's practice at all kinds of dental operations save gold fillings and porcelain work is very unusual.

Besides the usual dental operations, the Bellevue Hospital dental department cares for fractures of the jaw, tumors of the mouth, etc., thus giving a young man an opportunity to obtain experience along lines that cover the whole field of oral surgery.

Applicants must be qualified or able to qualify to practice dentistry in New York state.

Very truly yours,
Herbert L. Wheeler.

12 West 46th st., October 7, 1910.

PROCEEDINGS OF SOCIETIES.

NATIONAL DENTAL ASSOCIATION.

Fourteenth Annual Meeting, Denver, Colo., July 19, 20, 21, and 22, 1910.

GENERAL SESSIONS.

(Continued from page 1103.)

WEDNESDAY—*Second Session.*

The general session was called to order by the president, Dr. Thorpe, at 12 M. on Wednesday, July 20th.

Dr. H. J. BURKHART, chairman of the Executive Council, made the announcements for the order of the day's proceedings.

Dr. BURKHART also presented a report from the Executive Council, and moved its adoption.

The motion was duly seconded, and was carried unanimously.

Dr. E. R. WARNER, chairman of the Local Committee, then made the announcements of the time and place for taking the official photograph, and also as to matters of entertainment during the meeting.

Dr. F. O. HETRICK, chairman of the Clinic Committee, announced the program for the day's clinics.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Dr. EDWARD C. KIRK, chairman of the Committee on the President's Address, then presented the committee's report. As Dr. Kirk was suffering from throat trouble, the report was read by Dr. J. D. Patterson, as follows:

Mr. President and Gentlemen,—Your committee appointed to consider and report upon the President's annual address respectfully presents the following as the result of its deliberations:

We sympathetically join in the recommendation of the President that fitting recognition be made by the National Dental Association of the loss which that body has sustained by the death of one of its most eminent members, the late James Young Crawford, M.D., D.D.S., of Nashville, Tenn., and we recommend that the Committee on Necrology, or another appropriate committee, be instructed to prepare suitable resolutions expressing the high regard and appreciation which this association has always felt for Dr. Crawford, our feeling of sorrow at the loss we have sustained by his death, and our sympathy with the surviving members of his family in their bereavement; and that the report of the Committee on Necrology be presented for formal adoption by this association before the close of the present meeting.

We heartily commend that portion of the President's address which directs our attention to the present as being the golden anniversary of the organization of the American Dental Association, the representative of the principles and purposes which have been directly and continuously transmitted to our present representative national body, its successor, and directing our attention to the advances which have taken place within that period. We believe that the several marked advances noted by the president as having occurred during the organized life-time of this association are justly attributable in no small degree to the influence which this association has exerted.

Your committee joins with the president in expressing its gratification at the tribute of appreciation which the dental profession of Europe has paid to American dentistry by conferring the first W. D. Miller prize upon our distinguished colleague, Dr. G. V. Black of Chicago, and by the erection of a bronze monument to Horace Wells of Hartford, Conn., the discoverer of surgical anesthesia, and we recommend that suitable resolutions expressive of our appreciation of these marks of approval of the work of these eminent American dentists be forwarded to the secretary of the International Dental Federation and the secretary of the National Dental Association of France respectively.

The recommendations made by the president with respect to the two movements, one international and the other national, having for their common object the honoring of the memory of our most eminent dental scientist, the late Professor Willoughby D. Miller, have the cordial and unanimous indorsement of your committee.

Your committee is in hearty sympathy and accord with the position of your president with respect to the fundamental principles upon which dental education rests, has rested, and should rest—principles which have their foundation in the purpose intended by the founders of this organization, and which the president defines to be "The education of practitioners in the science and art of the conservation, treatment, and repair of the human teeth and their dependent structures, viz, the jaws, pericemental membranes, and gum tissues." We are further in accord with the view expressed in the following quotation from the President's address: "By no means is our present system of dental education perfect, for no education ever was, nor ever will be perfect, but we are headed in the right direction, and a constant furtherance along the present lines will result in the best possible achievement."

We are in agreement with the truth of his statement that "before medical men can undertake to instruct dentists, they have much to learn," and your committee believes that the "much to learn" here referred to must embrace no less than all that is comprised in what we today classify as the science and art of dentistry. It is the belief of your committee that it is of infinitely more importance for the welfare of humanity today that the medical profession should be well instructed in the main features of dental science, rather than that the dental practitioner should acquire the knowledge of those subjects constituting the medical curriculum, which would fit him for the medical degree.

Your committee feels that the references made in the President's address to the stomatological movement are both timely and pertinent. Your committee deems it to be regrettable in the extreme that there have arisen within the ranks of those who practice our specialty a proportion of its members who in their apparent over-enthusiasm to enlarge the field of dental activities by creating a new type of practitioner designated as the stomatologist, feel that they have such justification for destructive criticism of the educational methods and attainments of the dental specialty as to constitute them what the president has fairly designated "the detractors of our calling."

Your committee believes and fully concedes that honest difference of opinion and belief may exist with reference to methods of dental education, but it is in hearty accord with the president in placing the seal of condemnation upon that type of criticism manifested within our own ranks which distorts the facts involved, which is a perversion of the truth, and which your committee honestly believes is the major symptom of a lack of respect for our calling colored by a disappointed social or professional ambition.

Your committee interprets the spirit of the President's address with respect to this general question to mean that this association should regard the profession of dentistry as a special department of the science and art of healing, that its achievement in all of its phases during the seventy years of its organized existence has been attained as the result of adherence to the policy of its founders, viz, Horace H. Hayden and Chapin A. Harris, and that its most hopeful avenue of future development must be along the lines of strict adherence to the same fundamental ideas; that the dental profession must purge itself of the false and misleading notion that it can attain to greater eminence or usefulness to humanity by an organic merger with the medical profession through the avenues of the medical curriculum and the attainment of the medical degree.

Your committee fails to see any justification whatever for the existence of a specialty of medicine to be designated as stomatology, constructed at least along the educational lines thus far proposed, for the reason that everything which may be legitimately included in the specialty dealing with the oral cavity and its contained tissues naturally falls within the sphere of study and practice now constituting the field of the dental practitioner. The logical line of advancement, therefore, is to enlarge and improve the special dental curriculum so that it shall be

inclusive of the training necessary to adequately deal with the problems involved in the pathology of the mouth, rather than to create a new specialty in medicine, to which these same problems bear but a relatively remote relation.

In view of the general agitation of this matter, it appears to your committee to be an opportune occasion for the National Dental Association to place itself clearly on record before the world as to its position in regard to this important question, and to give its moral support and aid to those organized bodies of our profession throughout the world who in their various localities are at present contending with the activities of the stomatological fetish. We should thus stimulate among those who are the holders of the dental degree a genuine respect for their attainment, and help to neutralize the false notion which has been disseminated that professional or social respectability is an essential factor of the medical degree or of any other degree.

Your committee cordially approves of the references made by the president to the educational needs of our profession. It must be generally evident that an awakening is taking place in educational circles in all departments throughout our country. The factor of illiteracy in any nation is a condition of vast economic importance, which affects the welfare of a people so directly that all governments are vitally concerned in the question of education in every department of human inquiry. It is manifestly true that in the special department of education with which we are immediately concerned there is crying need for reform. Much has been accomplished in the past through the combined agency of the National Dental Association and its outgrowths, the Dental Faculties and the National Association of Dental Examiners. These co-operative influences have served to modify the primitive conditions which existed in the period of our professional organization, and have passed to the point where in many ways we have realized acceptable standards for education in our specialty. Notwithstanding the advances which have been made, there is a widely expressed feeling that the time is ripe for more definite advances.

It is palpable that a considerable proportion of those who are ultimately licensed to practice the profession of dentistry are not educationally equipped as they should be to meet the serious demands for trained judgment and skill which their professional problems impose, as the result of which the public does not in such cases receive the competent care and treatment which it is the intention of the state, expressed in its protective legislation, that the public shall receive. Your president has said that in referring to this question he realizes that he is "touching a nerve acutely sensitive." Your committee, while fully realizing the truth of this, nevertheless feels that the importance of the issues involved is such as to justify us in proceeding with what we should regard as our clear duty to correct such abuses in dental education as lead to the licensing of incompetent practitioners, and do so in the spirit of the surgeon who would not hesitate to remove a morbid growth in spite of the temporary suffering which the operation might incidentally involve.

With respect to the question of reorganization referred to in the President's address, your committee does not feel that it is sufficiently well informed with regard to the details of the plan, nor as to the results which the proposed plan of reorganization would be likely to achieve if put into effect, to enable it to express an intelligent opinion upon the question under consideration.

Your committee desires, however, to record its opinion that if reorganization of the National Dental Association in its practical operation means mainly a change in political management, as the address intimates, then your committee is in accord with the view of the president that reorganization at this time would be inexpedient. Furthermore, your committee feels that even though the suggested, or some other plan of reorganization be ultimately adopted, it would be wise to carry on the campaign of education with respect to reorganization among the component societies for a further period of time before putting the reorganization plan into effect in our national body. Your committee feels that there is yet much work to be done among those organizations which, under the proposed plan of reorganization, are to ultimately become components of our national body, before that interest in our organization so essential for its successful operation can be secured.

On the whole, and in the light of such information as your committee now possesses with reference to this important matter, we desire to express our general approval of the suggestions embodied in the President's address with respect to this question, and which we interpret as a recommendation to postpone final action upon the reorganization question until a future meeting.

Your committee desires to record its ap-

preciation of the broad-minded and liberal spirit which characterizes the admirable address of our president, and to particularly express its approval of the wise and judicial recommendations which the address contains, and the earnest, loyal devotion to the best interests of dentistry and its official national representative body which is throughout expressed in it.

Respectfully submitted,

EDWARD C. KIRK, *Chairman,*
J. G. FIFE,
RICHARD SUMMA,
Committee.

On motion, duly seconded, the report was adopted.

Dr. J. LEON WILLIAMS, London, England, was next introduced, and presented a paper entitled "Anatomical and Esthetic Prosthesis."

[This paper as revised for publication not having yet come to hand, it will be printed in a subsequent issue of the COSMOS.]

The general session then adjourned until 12 o'clock M., Thursday, July 21st.

THURSDAY—*Third Session.*

The general session was called to order at 12 o'clock noon, on Thursday, July 21st, with the president, Dr. Burton Lee Thorpe, in the chair.

Dr. BURKHART, chairman of the Executive Council, presented a report, which was on motion adopted.

Dr. H. C. FERRIS, Brooklyn, N. Y., chairman of the Committee on Scientific Research, then read the report of that committee, as follows:

REPORT OF COMMITTEE OF SCIENTIFIC RESEARCH.

Mr. President and gentlemen,—One year ago your committee made a report which entailed a great deal of work, and brought out a technique for salivary analysis, with a set of instruments and reagents. We did not expect to arouse a great deal of enthusiasm in this field, but hoped to find three or four men out of the entire membership of this society who would lend us a hand and report a few cases as requested. This did not prove to be our experience. Even though Eimer & Amend reported to us that they sold twenty outfits, we have received not one salivary analysis.

This experience, while a little discouraging, has nevertheless acted as a stimulus, and we again appeal to you, hoping that our presentation of the practical value of the research in this field will induce those who are analytically inclined to take up this work.

The American dentist has become famous the world over for his technical skill in mechanics. His advance in this particular has been phenomenal; his ability to re-establish the lost surfaces of the teeth and establish a normal occlusion has placed him in the front rank. But is it not true that in an effort to excel in this phase of our work we are forgetting that we operate upon a physical structure, a part of the human organism?

What do we know of the physiology of the organ of mastication, containing thirty-two teeth with one hundred and thirty-four inclined planes in normal occlusion? Are you aware of the fact that one of the leading physiologists of Europe commences his work with the gastric digestion, stating that the food is not long enough in the oral cavity to undergo any chemical or physiological changes? This assumption ignores the most powerful voluntary organ of the body, which produces forty-eight ounces of secretion daily, containing two or more animal ferments, and an oxydase with the power of instantly converting all free starches into dextrin, and albumin partially into albuminose, with a distinctive mucus which is detectable by gastric analysis. We believe this organ to be worthy of more consideration by the physiologist.

Furthermore, delicate reflex influences govern the flow and selection of the different kinds of saliva for the different kinds of foods, as has been proved by the experiments of the great biologist, Professor Pawlow of Russia, in which he has shown, by feeding a dog one hun-

dred and eleven times in a room with a bell ringing, again nineteen times in the presence of the odor of camphor, and one hundred times in a room with a red light, that the intensity of the reflex action of the auditory, olfactory, and optic nerves upon the salivary glands can be established.

He further showed that by feeding a dog with cracker crumbs his parotid glands were stimulated, and that by feeding him with meat the submaxillary and sublingual glands were markedly stimulated, to the exclusion of all others.

By feeding the dog fifty times with one drop of mustard oil he established a continuous reflex which operated for three days.

Moreover, the selection by the nerves of the tongue of the different kinds of food for the different forms of teeth has been shown in the Correspondent's Report of the New York State Dental Society this year. Are not these findings worthy of further consideration and more intimate study?

It has been proved by the experiments of Prof. A. Michel, M.D., director of the Royal Dental College, Wuerzburg-on-Main, Germany, that a man minus his molars showed starch globules in his feces, and minus his biscupids showed meat fibers in his feces, and that the artificial restoration of these teeth resulted in the correction of these abnormalities. These experiments also proved that, contrary to the physiologist's statements, the pancreatic secretion was ineffective in the reduction of starches, and that therefore, without sufficient mastication effected by proper teeth, complete chemical change and perfect digestion could not be accomplished. The findings of this scholar were verified by the examination of 2000 specimens of feces, carried on by Dr. Felix von Oefele, a New York pathologist of international reputation, and by two or three other investigators in Germany.

Professors Black and Kirk have been working for years upon the chemical changes that occur in the presence of caries and other lesions of the oral cavity, emphasizing the fact that a vicious cycle is set up by the improper functioning or use of this voluntary organ, leading to fermentation and putrefaction of starches and proteid substances in the intestines, the products of which are absorbed by the blood and so are conveyed to the oral cavity through the saliva, altering the environment of the teeth; and are also conveyed to the liver and kidneys, producing disease in these organs. These facts should be sufficient to cause us to consider our field from a more scientific standpoint, and possibly to open the way for a specialty in oral pathology.

We therefore again appeal to you for a more careful consideration of this branch of our calling. If a physician were asked if he be able to make a urinary analysis, he would be insulted; but how many among you are able to make a salivary analysis?

One physician in our country, Bernard R. LeRoy, M.D., of Athens, Ohio, in a paper published in the *American Journal of Ophthalmology,* May 1909, states that by salivary analysis and by re-establishment of the normal chemical balance he has produced the absorption of cataracts in four cases, enabling the blind to see without surgical operation. It is evident that the importance of a normal organ of mastication places our specialty upon a higher plane in the healing art than we have been inclined to claim for it. Should we not devote more of our time and thought to improving our information upon this subject?

The time has come when the dentist, if he will but take advantage of his opportunities, can become the peer of the specialists in the healing art, for it cannot be denied that primary lesions of all kinds are manifest in the salivary secretion before they are shown in any other excretions. It remains simply for us to determine the physiological properties of this secretion, to be able to read our findings. This takes *time,* but numbers of helping hands would obviate this difficulty. It takes *money,* but a voluntary subscription will take care of that. This work is for those among the young men who are fond of chemistry and analytical work. These men are expected to es-

tablish the physiological properties of, and the comparative relationship between the enzymic value of saliva and mucin, sulfocyanates and ammonia, chlorin and urea. The last comparison has been made in urinary analysis, and it has been found that a constant relationship exists which may be called a vital measure, the proportion being 1:2, the chlorin decreasing in disease. In order to facilitate the examination for urea, your chairman has modified a Doremus ureometer, which will give accurate findings in one ccm. of specimen fluid, and may be purchased of Eimer & Amend of New York. To make this technique accessible to you, we have printed a pamphlet containing complete technical information for your guidance, with many modifications of the methods presented last year, and we trust that there will be many to avail themselves of this guide:

Technique for Salivary Analysis.

History of chronic diseases.

Description of teeth and character of caries.

Amount of saliva. Normal average, 60 ccm. per hour; 20 ccm. required for examination.

Consistence. Report sticky, thick, or thin.

Odor. Ammoniacal, sweet, sour, etc.

Specific gravity. Normal 1.002.

Precipitate. Centrifuge entire amount and record in terms of the centrifuge scale. Then take 5 ccm. of this and dilute with an equal quantity of aqua destillata, which will become cloudy if globulin is present. Centrifuge again, and record amount of globulin. Pour off supernatant fluid again in the centrifuge tube; add four drops of glacial acetic acid, which precipitates the mucin. Pour off supernatant fluid and add 1 ccm. of 10 per cent. solution potassium ferrocyanid; if albumin be present, specimen will become cloudy. Centrifuge as before and record quantity of albumin.

Enzymic action. Take immediately upon delivery. Make 2 per cent. solution of starch paste, according to the following directions: Mix starch with half the quantity of cold water, and let stand for five minutes; then add the rest of the water, and boil for ten minutes. Take 5 ccm. of this solution in test tube and place in incubator at temperature of 55° C., to which add ½ ccm. saliva, let stand for one minute and boil to kill action of enzyme. Centrifuge, and read scale, which will give percentage of reduction of starch to dextrin. To determine further the product of the reaction, take 2 ccm. of the clear solution and add 1 ccm. of iodin solution N/250. If starch is present the reaction will be deep violet (iodid of starch); if a light violet, it indicates a partial reduction of starch, or erythrodextrin; a colorless result indicates complete reduction of starch to dextrin.

Proteolytic test. To 4 ccm. of specimen add 4 m. saturated solution of sodium hydrate; then add ½ ccm. of the following solution: 5 m. of Fehling's copper solution to 5 ccm. aqua destillata. If albuminose be present, the reaction will be a light violet on top of specimen.

Oxydase test. Take 1 ccm. saliva, 4 ccm. aqua destillata, 12 drops of 10 per cent. solution H_2SO_4, then mix, and add drop by drop 0.5 per cent. water solution of metaphenylendiamine. If there is no oxydase, it stays without color. If there is an oxydase, there is formed trianinphenyline, which makes the solution strongly yellow.

Test for acid index. Should be ascertained as soon as specimen is delivered. Use 1/40 normal sodium hydrate solution in 5 ccm. buret. The degree of acidity is obtained by taking 5 ccm. of saliva and adding 2 drops of phenolphthalein solution, neutral, then drop by drop 1/40 normal solution NaOH, until a rose color is produced. Having noted on paper the number of ccm. of the NaOH in the buret before and after the rose color is obtained, the number of ccm. displaced multiplied by 20 and divided by 4 (in order to find the number of ccm. NaOH necessary to reduce 100 ccm. saliva), equal the degree of acidity. Normal being alkaline.

To attain a more accurate result add 1 ccm. of 1/10 normal HCl solution, and boil to drive off the CO_2; titrate as before and subtract the acid index of HCl from result.

Test for alkalinity. Proceed as above, substituting 1/40 normal HCl for sodium hydrate, and methyl orange for phenolphthalein, and titrate.

Ammonia or organic matter. Take 2½ ccm. saliva and 1 drop phenolphthalein solution and titrate it with N/40 NaOH solution to a feeble pink color. The used ccm. of the NaOH solution gives the acidity in relation to phenolphthalein. Take formalin

and put in 1 drop phenolphthalein solution and titrate it with NaOH solution to a feeble pink color.

Now, both solutions are neutral or feebly alkaline to phenolphthalein; but if you put 1 ccm. of this neutralized formalin to the neutralized saliva the pink color disappears, because the ammonia is used up by the formalin. Now titrate a second time with N/40 NaOH until the reappearance of the pink color. This amount corresponds to the amount of ammonia. Multiply the ccm. by 0.017 and you have the percentage of ammonia in the saliva. Proof: 2½ ccm. and N/40 has the same relation as 100: N/1; therefore, the amount of grams in the amount of ccm. normal solution (instead of used N/40 NaOH solution) gives the percentage. Ammonia has the atomic weight of 17, therefore 1 ccm. normal solution corresponds to 0.017 per cent. and any amount of ccm. used must be multiplied by 0.017 per cent.

Sulfocyanate test. Use colorimetric scale (Eimer & Amend), 1 ccm. of specimen in tube A, 1 ccm. of 1: 2000 ammonia sulfocyanate in tube B; add 2 drops of 5 per cent. ferric chlorid to each tube, add aqua destillata until color in B matches that of specimen. Read scale in thousands and ten-thousands. Care must be taken to have the bottom of the meniscus on the line.

Chlorin. To 1 ccm. of specimen add 2 or 3 drops of potassium bichromate 1 per cent. solution; then titrate with N/10 silver nitrate solution until a light brick-red color is attained. Multiply the buret ccm. used by 0.3545. The result will show the amount of chlorin.

Urea. To attain the amount of urea, use a Ferris' modified Doremus ureometer, supplied by Eimer & Amend, New York. Tube A is washed with water and filled with hypobromite solution; close the stopper and fill tube B with 1 ccm. of specimen; open the stopper, allow specimen to enter tube A and close stopper. After all bubbles of gas have disappeared the reading is taken. The degrees marked upon the tube are divided into 0.025 and represent the number of grams or grains of urea contained in the amount of saliva employed. (The normal relation between the chlorin and the urea in the urin is 1: 2.)

Acetone. In 4 drops of specimen dissolve a crystal of potassium carbonate, then add a drop of Gram's reagent. An odor of iodoform indicates acetone. (Care must be taken not to confound the odor of iodin in Gram's reagent with that of iodoform.) To mount slide and examine with microscope for crystals of iodoform is best test.

Total solids and ash. To obtain total solids cleanse and weigh a platinum dish, into which place 2 ccm. of specimen. Dry in the incubator at 100° C. from two to three hours. Care should be taken that it does not turn too black. Weigh again, and add to this 2 or 3 drops of fuming nitric acid. Evaporate the acid and burn it white. Weigh again. The first gives the total of solids and the second the amount of ash.

NOTE A: To determine the percentage of chlorin in total solids, you multiply the chlorine by 110 and divide by total solids.

NOTE B: In urine the normal amount of chlorin is 15 per cent. of total solids, and it is reduced in pathological states.

In order to insure that this work may continue to progress, your committee recommends that the society take some action to supply funds for further research to produce findings that will be of practical value in the treatment of acid erosion, caries, pyorrhea alveolaris, and all the pathological conditions of the organ of mastication. In submitting this report we trust our efforts will not have been in vain.

Respectfully submitted,
H. C. FERRIS, *Chairman.*

SUPPLEMENTARY REPORT.

The undersigned member of the Committee on Research would beg leave to submit the following report of work accomplished during the year.

Your committee being handicapped in not having some definite object in view, and each member following a line in accordance with his own inclination, the writer followed the lines of bacteriology. He was greatly surprised at the frequency and the quantity of pneumococci found in the mouth, and would like to have some aid in following up the relationship between pneumococci in the mouth and pneumonia of the lungs.

While investigating the bacteria of the mouth, he became convinced of the pres-

ence of saccharomycetes in that organ, and cannot see why the yeast and mold fungi cannot both grow in the mouth.

He would recommend to the society that they suggest to the next Committee on Research Work that they make a special effort, and concentrate their work on saccharomycetes and actinomycosis during the coming year.

Yours very truly,
M. C. Smith.

There being no discussion, the report was, on motion, received.

Dr. L. Levitt E. Custer, Dayton, Ohio, was introduced, and read a paper entitled "The Bleaching of Porcelain Fillings."

[This paper is printed in full at page 1221 of the present issue of the Cosmos.]

Discussion.

Dr. D. O. M. LeCron, St. Louis, Mo. I have given much time and thought to, and have experimented considerably with porcelain, and therefore read Dr. Custer's paper with much interest and pleasure. The bleaching of porcelain fillings after being placed in position I have not observed very closely, although I have noted quite frequently the fading away of the normal color in many cases, which I attributed, however, to the over-fusing of the porcelain.

After reading this paper, I concluded that in order to discuss it intelligently it would be well for me to investigate some of my own porcelain work, and see what ravages time had played with the material. I therefore called into my office several patients and inspected twenty-two porcelain inlays which had been placed in the teeth from two to nine years ago, respectively. I am gratified to be able to state that out of that number only two inlays showed any evidences of bleaching, one to quite a considerable extent, the other but slightly.

The one which had bleached out badly was placed in position seven years ago last March, and the other, which had slightly bleached, was cemented to place in September 1907.

Six years ago I placed two other porcelain inlays in the same mouth in which I found the badly bleached inlay, and found these other two inlays perfectly normal in color. In my judgment, the bleaching of the inlay in that particular case was due to over-baking, and the two that stood the test of time and held their color may be considered typical cases of perfectly fused porcelain.

I also noted a porcelain inlay which—according to the patient's statement—Dr. Richard Summa had placed some three years ago, and also four that my son, Dr. Robert LeCron, had made and set in April 1904, and to the credit of these operators time has not worked any change, nor has any other element set up a bleaching process.

After examining these twenty-seven porcelain fillings placed in the mouths for the periods named above, and finding that only two of them showed any evidences of bleaching, I concluded that the baking of the porcelain plays a great part in the problem of bleaching of porcelain fillings, and that it is to over-fusion that we must attribute most of the destruction of the metallic oxids which produce the definite colors in the porcelain bodies.

The many failures recorded in porcelain work can be attributed to the fact that so many dentists have rushed into this work poorly equipped, performing it in but a slipshod manner, not knowing the first principles of cavity preparation or the details of manipulation of the various porcelain bodies, and having no conception of the composition of the materials with which they work.

The working of porcelain and all the details of manipulation require a higher degree of skill than any other work which falls into the hands of the dentist. I am quite positive that the bleaching of the porcelain can be attributed to the imperfect knowledge of its composition and want of skill in its manipulation.

The majority of operators who meet with failure in this field begin by doubting or depreciating themselves, or by losing confidence in their own ability to treat these cases.

My own many failures in this work proved to be an incentive to me to make investigations in order to learn the cause of these failures and a method of overcoming them. Three years ago I experimented on fusion and shrinkage, together with the crushing strength of the various porcelain bodies on the market, and made records of the results. From these experiments I reached the conclusion that correct fusion of porcelain is absolutely necessary in order to obtain a durable color and a reliable strength in the porcelain.

In making an inlay, it must, moreover, be borne in mind that with each baking the point of fusion of the porcelain is raised by at least 150° F.

So we find porcelain to be a most exacting material, and its correct manipulation must be learned by most exact and thorough experimenting.

It is to Dr. L. E. Custer's credit and honor that from his fertile brain the electric dental furnace has evolved, the greatest boon yet provided for the porcelain worker. He deserves great credit for the untiring work he has done for the dental profession, and I am sorry there are not more such conscientious and thorough investigators as Dr. Custer in our profession.

Dr. CUSTER (closing the discussion). I can only, in the limited time at my disposal, thank Dr. LeCron for the kind remarks made, and will not detain you with any further discussion of my paper.

REPORT OF LOCAL COMMITTEE OF ARRANGEMENTS.

Dr. E. R. WARNER, chairman of the Local Committee of Arrangements, presented and read his report, as follows:

It may be interesting to those present at this session to know the number of delegates and others registered. There may be some who have not recorded themselves, but the account kept by the registrar may be considered quite accurate, and the figures are as follows: Dental practitioners, 896; visiting ladies, 236; exhibitors, 74, making a total of 1206.

This list is approximately correct, although there may be a number who did not register, which would swell the total somewhat.

On motion the report was received.

The session then adjourned.

FRIDAY—*Fourth Session.*

The general session was called to order by the president, at 12 o'clock M., on Friday, July 22d.

The secretary presented and read a report from the Executive Council.

The report was on motion adopted.

The association then proceeded to instal the newly elected officers, who were called to the platform and severally addressed the members present, after the following remarks by Dr. Thorpe:

Dr. BURTON LEE THORPE. The time has come for the installing of the president-elect. In resigning the gavel to him, I desire to express my personal thanks to all the officers and committees and especially to the Local Committee, the Clinic Committee, and the section officers, each of whom have done such noble work in making this meeting a success.

I think it is true that this is one of the best, if not the best meeting the National Dental Association has ever held. We have had registered here nearly one thousand dentists, one hundred exhibitors, and two hundred and fifty ladies. Taking it as a whole, including the one hundred and forty new members whom we have received, it has been one of the best meetings held in the history of the association.

I desire also to extend my personal thanks to Dr. Stanley Rich, for bringing with him this excellent photograph of our beloved friend Dr. J. Y. Crawford. I want to extend my personal thanks for the many courtesies and kindnesses that the members of this association have shown me at this meeting, and in the past. Those of you who have believed in me, who have encouraged me, and inspired my every effort, I thank most heartily. I will now ask Dr. B. Holly

Smith and Dr. Melendy to escort the president-elect to the rostrum.

Dr. E. S. Gaylord of New Haven was then presented to the members, and spoke as follows:

Ladies and gentlemen, members of the National Dental Association,—This is the first time in the past thirty years when I have felt that I had occasion to call in question the action of this body. But I assure you, gentlemen, that in accepting this position, I am not unmindful of the honor which it has been your pleasure to bestow upon me. In the name of my state, I gratefully accept it, and I assure you that during the period of my occupancy of this office, I shall expect and shall insist upon your cordial support.

I also crave your indulgence for whatever mistakes, and very possibly there will be many, I may make, but you can rest assured that whatever I do will be done with a desire to advance the interests of our great profession and humanity.

Dr. C. S. Butler, the retiring secretary, was granted the privilege of the floor, and addressed the members as follows:

Mr. President, ladies and gentlemen, —The Executive Council desired me on its behalf to present at this time the thanks of the association for the splendid work which the officers and committees have done to advance the interests of the association during the past year and in preparation for this meeting, and they desire to thank particularly the Local Committee of Denver.

It has been my privilege for a good many years to have to do with our National meeting, and I think it is not at all invidious for me to say that in all my experience I have never known of more efficient work in the preparation for the meeting. Better team-work there has never been, and all without a discordant note. This is not unusual, perhaps, but I assure you it is very delightful, because you know there are multitudinous arrangements to be made, large numbers of men of judgment and experience to be brought to harmonize.

Personally, I desire to thank our retiring president for the splendid work he has done for this association during the past year. I think I have been in a position to know and to appreciate that work, as we have been in intimate touch during the entire time; and if I were to attempt to express my personal feeling and gratification at this time, I could hardly trust myself to do it in his presence, because there has grown up between us and the other officers of the association and committees a feeling that is more than friendship. It is one of the most precious experiences in my professional life that I can count among my intimate personal friends so many of the splendid men who are members of this association.

Dr. H. C. Brown. I think that we should one and all express our appreciation for the very efficient work of our retiring secretary, and in view of this, I ask the association to extend to him a rising vote of thanks for his efficient services in that capacity.

The motion was regularly seconded, and the Chair calling for a rising vote, it was unanimously carried.

Dr. C. S. Butler. Gentlemen, I thank you for this expression. I move that the President and the Executive Council be empowered to meet at their pleasure for the purpose of appointing the section officers and the usual committees of the association for the ensuing year.

The motion was regularly seconded and carried.

Dr. H. L. Wheeler. There is a little matter I would like to present. I understand that this association has had some trouble to procure a gavel for the president. I would like to make a motion that we present a gavel to each of the ex-presidents of this association, that we may always have one at hand, and that each presiding officer may keep one as a souvenir.

The motion was regularly seconded and carried.

Dr. J. W. David, the vice-president elect from the South, then announced that he would furnish a sufficient number of gavels, made of native Texas wood, suitably mounted, to be given to each of the ex-presidents of the association.

The National Dental Association then adjourned *sine die*.

SECTION I: Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

Chairman—Geo. H. Wilson, Cleveland, Ohio.
Secretary—B. Frank Gray, Los Angeles, Cal.

Wednesday—*First Session.*

Section I was called to order at 2 p.m. on Wednesday, July 20th, by the chairman, Dr. George H. Wilson, Cleveland, Ohio.

Dr. J. Lowe Young, New York city, was introduced, and presented a paper entitled "Deficient Development of the Arches of the Deciduous Teeth, and the Necessity of Early Treatment."

Dr. Young. I wish to say before I read my paper that I do not claim anything at all original in the methods outlined. There is a great deal of time wasted in discussion as to who did this or that thing first. I do not think that feature should enter into our work as professional men whose whole aim and desire should be the perfection of our methods and the dissemination of such ideas as we believe will be of benefit to the public and the profession.

[The paper was then read, as printed in full at page 1185 of the present issue of the Cosmos.]

Discussion.

Dr. H. A. Pullen, Buffalo, N. Y. In discussing this most timely paper, that of one whom I believe to be the ablest exponent of the modern methods of treatment of deciduous malocclusions, I wish first to call your attention to the fact that the essayist, in various portions of his paper, strongly emphasized the relationship existing between the causative factors involved in malocclusion and the treatment of malocclusion, pointing out the possibility of establishing conditions whereby normal development, not only of the dental arches but of the whole face, is possible after preventive treatment has been established.

In seeking after the causative factor in malocclusion the oral conditions in younger children have been studied, since it was thought, and rightly so, that as long as the cause for malocclusion did not seem evident at fourteen or fifteen years of age, it might have been noticeable at ten or eight or six or four years of age; or, if the causative factor became evident at fourteen years, the question would arise as to the date of inception of that causative factor, which again brings us back to the study of the conditions in the younger child.

Since these causative factors are found to exist at the age of from two to eight years, our patients come from the cradle to the chair, in a sense, and such preventive measures of treatment are instituted as will assure normal developmental conditions in the oral cavity and adjacent regions.

It may be possible that the family physician, or rhinologist, or ophthalmologist is called upon to assist in obtaining proper nutrition, unobstructed respiratory passages, and balanced and perfect vision, so that no pathological hindrance in the normal development of the child will arise.

In view of the fact that so large a pro-

portion of children are affected with deficient development of the dental arches and with deficiencies or abnormalities of the associated structure of the nose or throat or eyes, it would seem that the orthodontist, being often the first to diagnose these troubles, stands in a unique position in that he may, by treatment of deficient development of the dental arches and by reference to the specialist in associated fields, contribute more than any other specialist to the comfort, the health, and the beauty of the children of today.

From the orthodontist's standpoint, the treatment of deficient development of the dental arches has been fairly well defined, as is illustrated by the splendid results of treatment shown by the essayist. It remains for the dental profession, as well as the laity, to accept the results of these investigations, and to lend an impetus to the work of benefiting the children by orthodontic treatment and to the advancement of orthodontia as a science.

Dr. H. C. Ferris, Brooklyn, N. Y. In discussing Dr. Young's paper I wish to commend him for his compilation of vital factors from a sea of histological facts which particularly interest us in the diagnosis and treatment of the diseases of children. Orthodontia at this period of life demands the greatest care and consideration, also the highest degree of fitness in the operator, as the growing forces, if they could be measured, would astound us. An imperfect appreciation of these histological changes at varying periods would result disastrously. The essayist presents a very interesting scale of measurements by an eminent rhinologist. If these measurements were made upon subjects who were developing normally or whom the examiner had under observation for a long period, we can accept them as a standard, but if they represent an average taken without any orthodontic consideration, we can accept them only as interesting findings. That all the bones of the head are influenced in their development by use and disuse has been clearly stated by the essayist.

The author speaks of filling the deciduous teeth with plastic materials and suggests gutta-percha and cement. I must, however, disagree with him in the selection of materials. The expansion of the gutta-percha and the disintegration of the cement are unsafe factors, which can be eliminated by the use of amalgam or gold inlays and by a perfect restoration of the tooth's dimensions. I have no further criticism to offer, but must agree with all the vital points brought out by the essayist. I believe this paper is a good example for our future study of the detailed histological investigation that we must make to keep pace with nature and learn of her marvelous changes in order that we may direct with our mechanical means those forces which make for health and normal development.

We need more papers of this description, which are valuable additions to our knowledge.

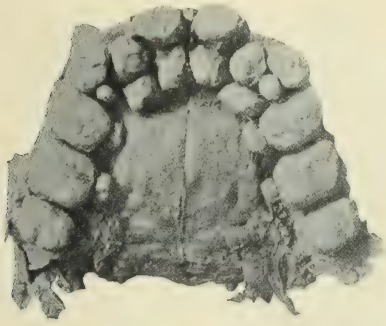
Dr. E. A. Bogue, New York, N. Y. I am glad to see Dr. Young and Dr. Ottolengui coming into line, and advocating early treatment when the arches of the deciduous teeth indicate such lack of developmental force that we know the incoming permanent teeth will not be normally arranged.

As Dr. Cronin of the New York Board of Health says, most babies are born all right, and start off toward normality, which is the most perfect form of the creature, be that creature man, lower animal, or vegetable. But this perfect normal development in babies is often interfered with, often arrested, for a time at least, and that temporary arrest, due to lack of strength at a given moment, may result in placing or leaving a mechanical obstruction to further development so difficult to overcome that nature, unaided, is not able to accomplish the task. Here, then, is where we come in to help nature by removing the obstacles that she could not overcome unaided.

In searching for a cause of this cessation of growth we may find a cold, or whooping-cough, or coryza, that required all the powers of the system to overcome; or we may find some of the exanthematous diseases, measles, scarlet fever, rubeola, possibly smallpox; in a word,

anything that disturbs the equilibrium of the circulation, and makes necessary a

Fig. 1.



greater than usual supply of blood to a given part, temporarily diminishing the supply in contiguous parts, which accordingly suffer.

and development. Intimately associated with the heart is the breathing apparatus —any defects in which, should they occur, tend to delay development.

If the child cannot breathe freely he cannot run and enjoy athletic sports, and he is liable to be cut off from his more active associates, and so to fail to develop because of this deprivation.

This brings us to the tables of developmental changes with which Dr. Young has favored us. We cannot question that these are accurate or that they have been honestly compiled and are fair and true records of the material that was before the examiners; but these examiners did not realize that the majority, if not all of their material, was more or less abnormal.

It will be necessary, as time goes on, to make entirely new tables, and it will be very difficult to secure such statistics as are adapted to normal conditions.

Fig. 2.



Fig. 3.



In trying to specify what we mean by lack of strength we are inevitably brought back to that great force-pump, the heart, which is the source of power in growth

Dr. Young says in his paper, "If there has not been sufficient growth of bone to accommodate these permanent teeth, they are very liable to become displaced from

pressure. In this stage of their development they resemble loose peas in a pod,

Fig. 4.

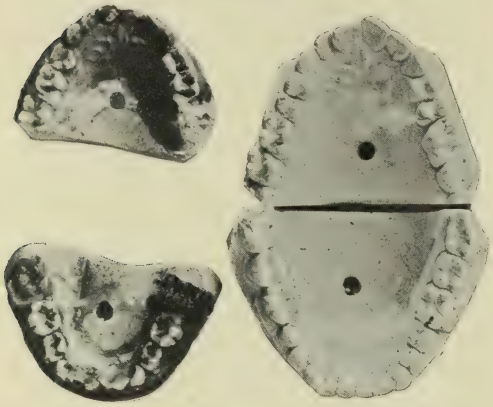


Fig. 5.



and might almost be displaced by a sudden jar."

I feel like criticizing that remark. The crowns of the permanent teeth which

Fig. 6.

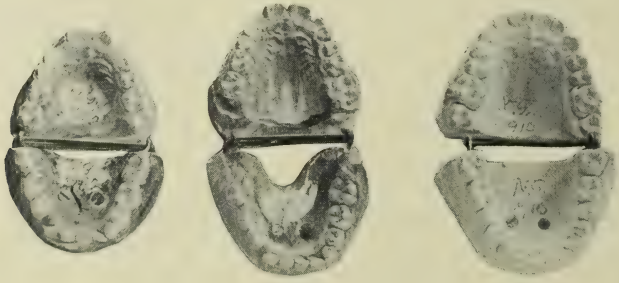
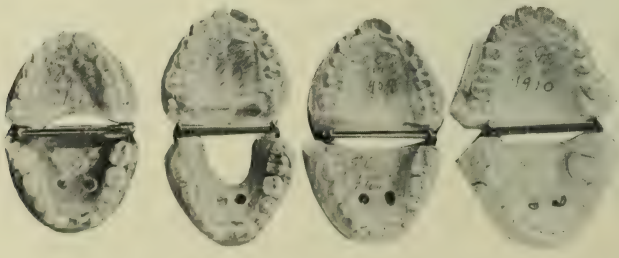


Fig. 7.



their crypts, the incisors and canines lying lingually to the roots of their predecessors, and the bicuspids between the roots of the deciduous molars. If these permanent teeth erupt without spreading the deciduous teeth, and come down in

replace the deciduous ones, as Noyes says, have all been formed and are lying in

the positions that they have occupied in their formative stage, they will need no

pressure other than the eruptive forces to be entirely irregular in their appearance, and I will show a diagrammatic chart that illustrates this condition. (See Figs. 1–3.)

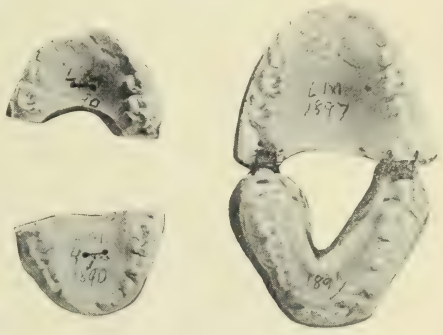
The crowns of the permanent teeth are fully developed, so far as size is concerned, before they come through the gum. When they erupt, therefore, if the eruption is normal, they require as large an arch in regular development as the adult, the only difference between the normal arch of the permanent teeth in a child and an adult being in vertical dimension, and in depth from front to rear. (See Fig. 4.)

Dr. Young, in quoting Noyes, says that "Normal occlusion is the agency by which the forces acting on the maxillary bone are distributed and preserved in balance, and it is these adult bones that are such important factors in the beauty and harmony of the face."

As normal occlusion is the exception, not the rule, it becomes us to acquire and promote normal occlusion at the earliest moment.

Dr. Young justly says that in order that these developing teeth may have sufficient room, the maxillary bones must develop to quite a marked degree in three directions: "The increase in width by

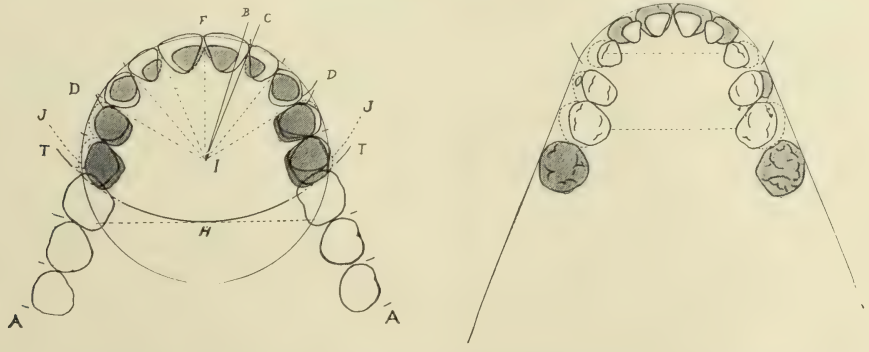
Fig. 8.



five or six years of age should be sufficient to accommodate the permanent teeth that replace the deciduous incisors and canines. In other words, the distance between the mesial surfaces of the first deciduous molars in the arch curve should be as great or a little greater than the combined widths of the permanent incisors and canines."

The fact is, that these developing teeth do not as a rule get sufficient room, and we have as yet no means of determining

Fig. 9.



[For detailed description of the chart the reader is referred to the article by Dr. Varney Barnes, entitled "Evidence and Significance of Tooth Eruption," *Items of Interest*, 1909, vol. xxxi, p. 668.]

An indication is here given of the way in which nature does not succeed, unaided, in acquiring normal occlusion when the strength of the body has been diverted from the regular order of development into the channels of repair, as I mentioned a few paragraphs back.

the exact sizes of the arches to which we would willingly draw the deciduous teeth when we know these arches to be of insufficient size.

I have been able to procure thirteen specimens of deciduous arches, together with the adult arches of these same thirteen specimens. (See Figs. 5–8.) I am hoping from measurements of these specimens, and perhaps some others that I may have, to arrive at some conclusions that may be serviceable.

Dr. Varney Barnes showed at the Washington meeting of the Society of Orthodontists a diagrammatic chart (Fig. 9), which I here reproduce, but he writes me that he cannot as yet determine from the deciduous teeth and their arches what the permanent ones ought to be.

Among the causes which interfere with normal occlusion, Dr. Young enumerates mouth-breathing, and then inflammation of the bone or its periosteum. I would suggest that, before mentioning inflammation of the bone, he first mention caries of the teeth, which leads to sensitiveness, which if neglected is followed by exposure of the pulp, causing pain when the teeth are in contact, which leads to abscesses, and thence to chronic inflammation of the periosteum, which in its turn leads to necrosis.

The argument in favor of the necessity for early treatment may well embrace all those influences which tend to interfere with the perfect development of the whole body.

Dr. F. S. McKay, Colorado Springs, Colo. This paper is a specially timely and relevant one for the general practitioner. It is gratifying to see that the technical details of the correction of these anomalies are omitted. In a gathering of this sort, we should go directly to the fundamentals involved.

The subject of this paper is bound to be of interest to our rhinologist friends, as much so as to ourselves. It is becoming more and more evident that the rhinologist has found a valuable ally in the orthodontist, and the reverse is also true. That also places another duty and responsibility upon the general practitioner of dentistry, in that he must recognize the relationship between the development of the dental arches and that of the nasal fossæ and accessory sinuses, and must point out that relationship early, so that the child, if necessary, may have timely treatment that shall aim toward bringing about normal development. It is, for many reasons which I need not enumerate, a well-established fact that the establishment of a normal occlusion of the teeth and a normal breathing-space is the ideal to be arrived at in these treatments; but back of all that, is it not a higher ideal, and one worth attaining, if we can prevent malocclusion to a great extent, and also lack of development of the nasal chamber?

There is no case of malocclusion in my estimation, however difficult it may seem when it is presented to us, that did not have a small beginning and a simple cause. So it is of the utmost importance for us and for the patient that the initial cause be pointed out, and treatment be instituted in the early and the simple stages.

As the essayist shows, and as the gentlemen who have preceded me have emphasized, unless some special influences interfere the development of the deciduous arches will be normal.

Among these influences, as has been mentioned before, adenoid growths, enlarged tonsils, and some habits of childhood, which the essayist also mentions, are most prominent. Malnutrition has also been mentioned as a frequent and no doubt important cause. But we may, as our studies proceed, find that malnutrition is only another name for dietary errors.

I do not know to what extent the essayist ascribes these anomalies to heredity —probably he goes about as far as I do; but I must say that I am coming more and more to the conclusion that heredity has very little to do with them. We have attributed anomalies to heredity because we could not define the real causes.

As far as heredity is concerned, I believe, as I think Dr. Brady has said, that what we really inherit is the normal. Nature intended us to have what is due us, and if we do not get it, we must look

for the cause in some interference with nature's proper workings.

In regard to conditions in the deciduous arches, we used to think, perhaps more than we do now, that mesio-distal malocclusions had their origin in the eruption of the first permanent molar and its sequels; but I believe we shall find more and more that mesio-distal malocclusion has been already established in the deciduous denture, although I must say that I never have seen a class III case so established. But I have frequently seen cases of class II, of distal protrusion of the mandible, established in the deciduous denture.

In reference to lack of development of the deciduous arches, we find more and more that these are crowded and bunched. It has been an open question with me as to whether we were really justified in attempting treatment before the eruption of any permanent teeth. It perhaps will not take much more argument or experience to convince me that that ought to be done, and we may find it is essentially the proper thing to do. But I believe there is no excuse for letting mesio-distal variations of occlusion continue when they are well established in the deciduous denture, for reasons I need not enumerate, though I will mention the principal two: Inability to masticate properly, and, more especially, the facial distortion which such malocclusions are bound to result in.

Many factors combine in the deciduous denture to bring about serious malocclusion of the permanent teeth, as well as extensive caries, as has been emphasized. In my estimation, extensive caries of the deciduous denture is an inexcusable condition in modern dental practice, and with proper instructions to parents and to the little children, it may be and is prevented. Those of us who have ever examined any large number of children, in either the public schools or in charitable institutions, are shocked to find the conditions as they invariably exist, especially when we anticipate the condition in which the permanent denture will be.

Heredity surely is not to be blamed for these conditions. We must not wait until the permanent dentures are in place before advising correction. It is most embarrassing at times to all of us, after we have carefully demonstrated to the parents of our child patients the necessity of early treatment, and have pointed out to them the conditions that have been brought about by delay in treatment, to have the parent say, "My dentist advised me nothing could be done, the child was too young," or, "Nothing can be done now, I must wait until those permanent teeth come in." Unfortunately in such cases we cannot say anything that might convey our lack of respect for the advice of the general practitioner, as we do not wish to affect that patient's regard for him. But I feel that such advice is very wrong, and that the general practitioner has very little excuse for giving it, now, when our literature is full of just such papers as Dr. Young's, which point out distinctly the error of such advice. Fortunately, as the essayist has said, the time is coming rapidly when parents will ask some very embarrassing question of practitioners who persist in giving such advice.

Only the other day, I saw the case of a child of from fourteen to fifteen years of age, whose permanent teeth had all erupted except the third molars. The incisors were crowded and overlapped, the dentist having advised that nothing could be done until the permanent canine had erupted. He had failed entirely to see that the lower arch was distal. It was a case of class II, division 1. In the meantime the retrusion of the mandible had been progressing, the face was being weakened, and irreparable damage was done. I do not think that the development of the mandible could be secured by treating this case now. If the value of early treatment had been pointed out in time, the child's face would be entirely different at the present time.

I believe that our friend, the rhinologist, should understand these conditions as well as we do, but best of all, the general practitioner should be in full accord with the idea of early treatment.

Dr. S. H. Guilford, Philadelphia.

The paper to which we have listened contains so much common sense and has so few points open to criticism that I can heartily congratulate Dr. Young upon his method of treating the subject. He is not a radical, neither is he a conservative, but he has taken his stand between the two extremes. I can thoroughly agree with him. One of the points that I wish to discuss briefly is the conditions which indicate to the practitioner that the deciduous arches need expanding, and which, when observed, should determine the question of their expansion at once. There is nothing in the whole domain of surgical care of the deciduous arches that is truer than that. Just as soon as we see that conditions are not normal, we must exercise our judgment and skill in order to set them right.

First of all the question arises as to when the deciduous arches will need expanding? In normal eruption the deciduous teeth come into their regular predetermined positions because nature works along correct lines, and when not interfered with will do her work perfectly. Sometimes a little variation will occur, but as a rule there will be normal alignment. Why is it that nature produces an harmonious arrangement of deciduous teeth in nearly all cases? It is because, the infant having no teeth in the beginning, the deciduous teeth have an opportunity to come into their proper locations; there is nothing to interfere with their eruption in any way.

Many years ago, Sir John Tomes of London, in his "Dental Anatomy" described the case of a child who had lost all of the deciduous teeth before any of the permanent ones had erupted, and he considered it very remarkable that the permanent teeth should have subsequently erupted in their regular positions under those circumstances. On the contrary, I should say it was not remarkable, but that nature was merely working without any obstruction. There were no deciduous teeth to interfere with the permanent dentition, so the permanent set erupted perfectly.

When the deciduous teeth have taken their places in the arch, it becomes the duty of the dentist to conserve those teeth, to guard against the influences of caries, which when detected should be immediately eradicated and corrected. But those deciduous teeth should not be mutilated in form or contour; their entire diameters are needed to maintain the arch space, for if that space is not preserved owing to injudicious cutting or loss of a single tooth, one of the most necessary elements for the proper maintenance of space for the permanent dentition is lost. When the permanent teeth erupt they force their way into place, and the arch is enlarged by virtue of a certain stimulus, and if we could maintain the normal arrangement and number of the deciduous teeth, barring the effect of the diseases which the essayist has alluded to, the most important of which are adenoids, we should find the permanent teeth taking their proper places without any assistance.

I have referred to this feature of the paper merely to emphasize the importance of the preservation of the deciduous teeth, because, if they can be preserved in full size, contour, and health, very little will have to be done in the way of correcting irregularities of the permanent teeth.

In the latter part of his paper, Dr. Young speaks of the importance of the average practitioner making himself familiar with conditions causing irregular arrangement of the permanent as well as the deciduous teeth. That is the keynote of the whole subject. I have always tried to impress upon those with whom I have come in contact the importance of the general practitioner's studying this subject sufficiently to be able to understand the fundamental principles, so that when a case is presented he may be able by an oral examination to decide just what is needed, and to proceed accordingly. It is not necessary that every dentist should consume the time necessary to familiarize himself so thoroughly with the subject of orthodontia in all its bearings as to be able to handle all cases of irregularity which come to him in general practice. Many, and in fact the majority of general prac-

titioners dislike orthodontia work, owing to the fact, perhaps, that they do not understand it and look upon it as an intricate science. But notwithstanding their repugnance, I consider it their duty to know enough about the subject to enable them to decide when corrective treatment is needed, and then, if the practitioner does not feel competent to undertake it himself, he can refer the matter of correction to the specialist.

This is bound to be the situation in the future. The specialists in orthodontia have come to stay, and will increase in number, so that in course of time there will be a sufficient number of men devoting themselves to this work to take charge of all cases that are referred to them. But their efforts will be assisted and the success of their operations greatly enhanced if the general practitioner will familiarize himself with the existing conditions, so that the work of the specialist may be begun promptly.

Dr. Young (closing the discussion). I wish to reply to one or two remarks that have been made; first to Dr. Ferris, in regard to the use of gutta-percha and cement. My paper did not treat of that subject.

Dr. Bogue spoke about the permanent teeth normally erupting irregularly, and he showed one slide and some diagrams illustrating that. One swallow does not make a summer, neither does one irregularity prove that the permanent teeth always erupt irregularly. I do not believe that the case shown was developing normally, nor do I believe that to be the normal way for teeth to erupt.

Dr. Guilford mentioned a case cited by Sir John Tomes, in which the deciduous teeth were lost very early and the permanent ones erupted properly, which he considered very peculiar—and I certainly agree with that view, for I do not believe that the same would occur in one per cent. of cases, if we were to remove the deciduous teeth say at three years of age. In order to bring about normal eruption of the permanent teeth there must be proper bone development, owing to the fact that the permanent teeth are much wider than the deciduous ones, and if there is nothing in the jaw to stimulate bone development a crowded condition of the permanent teeth will result. Dr. Guilford remarked that he never saw a class III case in the deciduous teeth. While I have never treated a class III case of malocclusion of the deciduous set, quite a number of such cases are on record. Dr. Howe has made a very careful observation of a child whose parents presented class III malocclusion, and the child, wishing to look like the parents, imitated them to the extent of protruding the mandible, and was rapidly developing a class III malocclusion. If Dr. Howe had not been a close observer, very likely this case would have been attributed to heredity, while as a matter of fact the child did not inherit the defect, but contracted it by mimicking his parents, and Dr. Howe by talking to the child, was able to induce him to occlude normally. This case is one well worth careful consideration.

Regarding the question of beginning treatment before the eruption of any of the permanent teeth in class I cases, it seems to me just as logical as night follows day that when at the time of eruption of the first permanent molars there are no spaces between the deciduous incisors, there will not be sufficient room to accommodate the permanent incisors when they erupt.

Dr. Weston A. Price of Cleveland, Ohio, was next introduced, and read a paper entitled "The Laws Controlling the Behavior of Gold in Fusing and Casting."

The section then adjourned until Thursday morning at 10.30 o'clock.

(To be continued.)

NATIONAL DENTAL ASSOCIATION—SOUTHERN BRANCH.

Thirteenth Annual Meeting, held at Houston, Texas, May 4, 5, and 6, 1910.

(Continued from page 1122.)

FRIDAY—*Morning Session.*

The meeting was called to order Friday morning, May 6th, by the president, Dr. Chace, at 9 o'clock.

The secretary, Dr. MASON, presented a communication from the American Miller Memorial Committee.

Dr. J. P. GRAY moved that the sum of fifty dollars be appropriated to that committee. Motion carried.

REPORT OF COMMITTEE ON OPERATIVE DENTISTRY.

Dr. M. S. MERCHANT, as chairman, presented the following report of the Committee on Operative Dentistry:

To the President and members of the Southern Branch of the National Dental Association,—I shall not make any report except that of the work done by the committee, without giving a dissertation on operative dentistry. The committee fully covered the Southern Branch territory with letters asking for papers, the chairman sending out more than three hundred letters himself, and receiving about fifty replies, with the promise of seven papers. One of these papers, however, was later withdrawn on account of the illness of the gentleman who promised it, Dr. C. S. Stockton of New Jersey. The papers which the committee has to offer are announced in the program.

M. S. MERCHANT, *Chairman.*

The next item on the program, as announced by the Committee on Operative Dentistry, was a paper by Dr. L. P. ROBERTSON, Marlin, Texas, entitled "A Plea for the Porcelain Inlay," as follows:

A PLEA FOR THE PORCELAIN INLAY.

To my mind it is not to the credit of the dental profession that the most important factor contributing to the really artistic in dentistry, and a method in practice which has had as much to do with elevating the dentist from the artisan to the artist as has the porcelain inlay, should be permitted to fall into the background and to sleep the sleep of the almost forgotten past, by many who are perfectly competent to do this class of work, but fail to appreciate its beauties and importance. The porcelain inlay has formed the true distinction between dentistry as a fine art and dentistry as a mechanical art—and certainly there is something more in dentistry than simple mechanics. This paper is written for the purpose of advocating a keener appreciation and closer observance of the ideal in dental art. We must constantly aim for high ideals, and our ideals are useless unless we make them keep pace with progress. It was only a few years ago that porcelain held the attention of the dental world, and everything written on the subject was eagerly sought and read.

VARYING POPULARITY OF PORCELAIN.

At that time, porcelain was the enlivening feature of all the dental meetings. At the Fourth International Dental Congress, held in St. Louis in 1904, the majority of the clinics consisted in demonstrations in porcelain, and the clinicians in porcelain attracted most of the spectators, who were all charmed with the beautiful work done by these

artists in producing beautifully natural colors in porcelain. After years of struggle against much adverse criticism, porcelain had forged its way to the front and established its place as the crowning glory of the dental profession in this wonderful twentieth century of progress and achievement. This condition gave promise of a full fruition of the hopes that many had cherished for years, of establishing dentistry upon a higher and more esthetic plane by restoring the teeth to that symmetry and beauty which nature had stamped upon them before they were marred by disease. It has been said that the highest attainment of art is the concealing of the art, and if we would maintain our claim as artists, it is incumbent on us to do something to check the tendency on the part of some operators toward neglecting or abandoning porcelain, the real foundation upon which we can base such a claim.

THE ESTHETIC MERITS OF PORCELAIN.

There is still too great a display of gold, which constitutes a serious offense against esthetic taste. For more than twenty years we have been confronted with the unsightly gold crown, and for a longer period with the conspicuous gold filling, that mars many otherwise handsome faces. Is this stamp of disgrace to remain on our profession with only an occasional feeble protest? The disfiguring brand is no longer placed upon the horse. Is not the human face entitled to as much protection against being disfigured as the horse? While it is not the purpose of this paper to dwell upon the merits of the porcelain inlay as a substantial or durable filling, still this plea for its more extensive use would be without force if we could not show by experience that in its proper place it fulfils the requirements in that respect.

PRACTICAL EXPERIENCE AS TO THE DURABILITY OF PORCELAIN.

I can already hear some say that from an esthetic standpoint porcelain is the ideal filling, but that from a practical standpoint it is a failure. Let us see if that is the case. Dr. W. A. Capon of Philadelphia makes a very comprehensive report of his experience with porcelain in a paper published in the DENTAL COSMOS for September 1908 under the heading "Porcelain After Eighteen Years," giving a detailed description of the condition of some twenty-four cases after eighteen years of service. Some of these were large restorations involving a third or more of the cutting edges of the incisors, and some were large approximal fillings in incisors, canines, and bicuspids.

The excellent condition of these fillings after eighteen years of service is a much stronger argument for the porcelain inlay as a durable filling than any mere statement that I can make in this paper on that point. I will state, however, without going into a detailed report of cases, that my experience and observation accord with the report made by Dr. Capon. The advent of the gold inlay and the silicate cement filling doubtless had much to do with putting the porcelain inlay in the background, but I hope and believe that the position which porcelain is occupying at present is a temporary one, as neither the gold inlay nor the silicate cement filling, in my opinion, can ever take the place of porcelain, the former for esthetic, the latter for practical reasons. We are too much inclined to go from one sensation to another, and are always looking for something easy. Porcelain work is not easy, but the difficulties are not so great as some imagine; besides, it requires skill and patience to do anything well in dentistry. And it is not the easy things we do that arouse our pride or develop skill.

INDICATIONS FOR THE PORCELAIN INLAY.

I shall briefly mention the places where I think the porcelain inlay is indicated. All labial cavities, all large or conspicuous approximal cavities of incisors, canines, and bicuspids, and all incisal edges lost by accident or otherwise should be restored in porcelain, especially in the

mouths of women; in fact, in all cases where the display of gold would constitute an offense against esthetic taste. In some cases the cast gold inlay in combination with porcelain can be used to advantage by baking low-fusing porcelain on the face of the gold inlay. This latter method possesses the advantage of protecting the porcelain from chipping under the stress of mastication. It is rather difficult, however, to bake porcelain to gold so as to make a good joint.

Discussion.

Dr. Julian Smith, Austin, Texas. I not only wish to commend the essayist's paper, but also to support the ideas presented by him. Porcelain is a material which requires some experience, but the good results obtainable are absolutely beyond question. There are many difficult features about working porcelain which are only appreciated by the operator who has sufficient stability to stick to it until he can at least make more successes than failures.

I suppose that every operator who manipulates porcelain, even Dr. Capon himself, experiences a large percentage of failures, but these failures are easily corrected by renewed efforts. The failures I refer to are due to the difficulty of mixing the colors, which in many instances is a very difficult and troublesome operation. Many times we make fillings which are perfect in other respects, but which, when set in the cavity, do not satisfy the artistic eye. Therefore I call them failures, and these inlays must be made over. Any operator who does not expect to have any failures is out of his field if he takes up porcelain work.

As to the stability of the porcelain inlay, I will say that I do not believe that any class of work is more to be depended upon. When I first began to do inlay work, I experimented with porcelain for two years in the laboratory before I inserted an inlay in a patient's mouth. After two more years, during which time I inserted many inlays in the mouth, I removed as many of them as I could as soon as the opportunity offered. As to their coming out, I will guarantee that if you dismiss a patient with an imperfect inlay, it will stay there.

Some operators contend that the cement is the weak part of the inlay. I have inserted very extensive contour fillings which did not suit me, for which reason I made engagements to make them over. Recently I made an extensive inlay in a central incisor involving one-third of the mesio-occlusal surface. I tried to take it out by my usual method of holding a little sharpened point of a tooth-brush handle against the outer corner of the inlay, tapping it with a hand mallet in the opposite direction, because all of my retention is made underneath. I used such force in the blow that the patient complained of pain in the tooth, and still the filling refused to move. Finally I had to use enough force to break the filling in halves before the cement became loose. I then drilled out the cement in order to remove the rest of the filling, the attachment being absolutely perfect.

If discretion is employed in the use of porcelain inlays, they are certainly most serviceable to our patients. The esthetic side, of course, is beyond dispute.

Dr. B. F. Thielen, Paris, Texas. I am a porcelain enthusiast myself, but, unlike Dr. Robertson, I do not believe we should ever put porcelain fillings posterior to the canines. My experience in such work has been a sad one, the patients often coming back with the porcelain inlays in their pockets. Most porcelain workers, in my opinion, are realizing that these inlays should not be placed in the posterior teeth, especially when there is any stress on them.

Dr. J. P. Gray, Nashville, Tenn. Almost all porcelain operators have abandoned the work, I think. Dr. Smith said that he often found a change in the color. We find probably just as often a change in the color of the tooth.

Dr. Smith. Dr. Gray misunderstood me. I did not say that there is any change in the color of the porcelain, but that it often occurs, when we have fin-

ished the inlay and set it in the tooth, that we find we have not succeeded in obtaining the desired color. The color of the porcelain is absolutely stable.

Dr. Gray. The natural tooth often changes in color, especially in ladies, but may return to normal again. Many of you have seen a tooth that changed after a year's time, though at the beginning there was a perfect match between the tooth and the inlay. This is therefore one of the troubles we encounter in the use of porcelain. Very few operators make perfect porcelain fillings. I hope, however, that the profession will advance to a high state of perfection in that work and do away with so much gold. Operators should be cautious in placing gold anteriorly to the molars, if such fillings will show to any extent. In our practice of extension for prevention we exhibit too much gold, and we should in my opinion modify the extension just enough to establish a contact point, and not cut clear to the labial surface and extend the cavity for the sake of convenience, as is so often done. I do not believe that it is at all advisable to put in porcelain inlays posteriorly to the canines if there is any stress. In the buccal cavities in bicuspids and molars the inlay may be successful.

Dr. Robertson (closing the discussion). I appreciate the generous manner in which you have received and discussed my paper. This subject is important and should not be lost sight of. We should lend encouragement to those who have taken up porcelain work and who think that it is not a success. They can be convinced, I am sure, that it can be made a success.

As Dr. Smith said, the esthetic feature is beyond dispute. Even though we do not succeed in perfectly matching the porcelain with the natural tooth, in most cases we so nearly approximate the colors that the inlay is not noticeable at the distance of conversation. That is not the case with gold, which can be seen as far as the eye can reach.

As to the objection made in regard to putting porcelain in the bicuspids, I admit that it is very difficult to place and maintain a porcelain filling posteriorly to the canines, and it is only in extreme cases, where there is great loss of structure on the mesial surface of the buccal wall, that there is any necessity to do it. In such cases I have been able to employ the method suggested in the latter part of my paper, *i.e.* baking low-fusing porcelain on the conspicuous surface of a gold inlay after casting. Very little porcelain is required, as it is not necessary to have a very thick layer of it at that point. We can take a wax model, carve out a little of the conspicuous surface, mesial or buccal, and after the gold is cast, bake a little low-fusing porcelain to that surface, which will show up very nicely. In making a cast gold inlay that is to receive a porcelain veneer, it is absolutely necessary to use non-oxidizable gold, because porcelain cannot be baked on a gold alloyed with anything that will cause oxidation. Such an inlay should be made of pure gold, or of one of the non-oxidizable golds on the market.

The next order of business was the reading of a paper by Dr. G. S. Staples, Sherman, Texas, entitled "A Warning Against Dental Fads," as follows:

A Warning Against Dental Fads.

As we all know, the human family is naturally inclined to fads and fancies, but it sometimes seems to me that the dental profession is worse in that respect than all other professions put together. I therefore would like to sound a warning. I have been practicing dentistry for forty-three years, or nearly that long, and have seen many radical changes in that time. In fact, I may say I have seen the profession revolutionized several times, and in those revolutions we have never failed to note the fad idea.

THE GOLD-FILLING FAD.

For instance, about the time when I began practice the idea was in vogue that gold was the only material to fill teeth with, and so we filled teeth with gold and robbed ourselves and our patients,

and didn't do nearly as good work in hundreds of cases as we could have done with amalgam, with a great deal less expense to our patients and with more profit to ourselves. That was the first fad.

THE CROWN AND BRIDGE WORK FAD.

Then came crown and bridge work, which has been the greatest fad and the worst fraud that has ever been imposed on a long-suffering and patient public, and still the wretched work goes on, to the everlasting shame of the dental profession. When crown or bridge work is called for in our practice, there is nothing that will take its place, but I honestly believe that in more than ninety-nine per cent. of cases an amalgam filling instead of a crown, or a small plate instead of a bridge, would be much better.

THE INLAY FAD.

Now comes our latest and worst of fads—the inlay. There are hundreds of operators who seem to be perfectly wild on the subject of inlays; in fact, they apply inlays in every case. Some of these operators could not make a good gold filling, and yet they seem to think that they can make good inlays. Again I would sound a warning. My advice is to drop all fads, and take time to consider what is best for each patient. When the operator has decided regardless of money consideration, then he may go ahead and do the work, and then he will have done his duty.

The truth of this whole question is, that when the teeth need a crown, a bridge, or an inlay, nothing else will take its place, and when a dentist uses discretion in such cases, he is serving his *clientèle* as he should.

Discussion.

Dr. L. P. Robertson, Marlin, Texas. We Texas dentists owe Dr. Staples a great debt of gratitude, for he has acted as a balance-wheel for the young enthusiasts for the twenty-six years during which it has been my privilege to be associated with him.

I do not feel willing to allow this paper to pass without speaking a word of commendation for the splendid points that the essayist has brought out. A number of years ago Dr. Staples demonstrated the possibilities and the limitations of the amalgam filling, long before the gold crown was in use in this country, and his observations have been worth a great deal to me, and I am sure many others have profited by his advice. One of the most important features of our work is accuracy and thoroughness, and the essayist has set for the dental profession the highest standard in these points, his results showing all that could be desired.

Dr. Julian Smith, Austin, Texas. I feel entirely in accord with Dr. Staples' statements on this subject. There is no man in the dental profession with whom I would rather confer than with him.

It seems to me that while thoroughness is one of the crowning attributes of success in dentistry, as Dr. Robertson said, next and possibly equally important is the idea which Dr. Staples advanced throughout his paper; that is, conservatism—the right thing in the right place. The gold crown has probably done more damage to the dental organs of the people at large than any other class of work. Occasions arise where we cannot use anything else, but in many cases good work can be done without the gold crown. Teeth are too often sacrificed because crowns are easy to put on and somebody is willing to pay for them.

Dr. Staples says that inlays are used too much, and while he knows that I am one of the most enthusiastic advocates of the gold inlay in this state, as from the beginning, I am pleased to be able to inform Dr. Staples that I never put a gold inlay in the front of the mouth. The inlay is a good filling, and porcelain inlays are especially indicated in the anterior teeth.

Dr. Staples (closing the discussion). My paper, as I said, was intended to

bring out discussion, and I think my friends have said nearly as much as can be said on the subject.

I am not radically opposed to inlays of any kind, or crown and bridge work when it is called for, but my purpose was to demonstrate that the human family is prone to fads. My idea has always been, and is now, that the weakest point in human nature is lack of judgment. We all are too prone to run off at a tangent without thinking a moment, and that accounts for so many inlays, crowns, and bridges in uncalled-for places. The average dentist is like the average citizen in any business; if he has anything to do, he does his work right away, and thinks about it afterward. I have tried all my life—and I get radical sometimes on some subjects—to be conservative in dentistry. When a case presents, the first question I ask myself is, What is the best thing to do in this case? Then I do the work, but never decide what is best afterward.

In our town of Sherman nearly one hundred dentists have practiced since I have been located there. One of the best men that has ever been there, and one of the best operators in Texas—I tell this as an illustration of the way in which we lack judgment—came to me one morning with a model of the mouth of a boy of fourteen years of age, whose teeth he was going to straighten. I looked at the model and saw that a bicuspid had recently been extracted. That dentist had first extracted that tooth, and then had taken an impression and commenced to study the case. He brought it to me as soon as he had obtained the model, and wanted advice on the subject. I asked him if he had extracted the bicuspid because it was carious. He assured me that the tooth had been perfectly sound. When asked for his reasons for the extraction, he stated that he wished to secure enough room to get the teeth straight. In ten minutes' time I showed him how, if he had regulated the teeth as he should have done he would have had enough space for that tooth; as it was, he had a surplus of space. Such after-thinking is done in all branches of dentistry, therefore we must get the profession to timely thinking.

The next order of business was the reading of a paper by Dr. J. E. Storey, Beaumont, Texas, entitled, "Some Things in Operative Dentistry," as follows:

Some Things in Operative Dentistry.

Thousands of papers have been written on the subject of operative dentistry, and were it possible for every paper that has been written to have made an operator in addition to those who are born operators, then a world of good would have been accomplished, and time and printer's ink would not have been spent in vain.

JUDGMENT IN OPERATIVE DENTISTRY REQUIRED.

Judging from the fillings seen in the mouths of patients who present themselves at our offices, we know very well—if we ourselves are acquainted with operative technique—that not one dentist in every one hundred knows how a tooth should be filled. He knows, or thinks he knows, how to stuff "amalgum" in a hole that decay has started for him. He knows nothing of cavity preparation; self-cleansing surfaces and extension for prevention are beyond him. He knows a bur when he sees one because his supply man has told him what a bur is; he believes it will cut because he has been told so. You can bet he will not allow that bur to do its proper work. It is not timidity that holds him back, but simply lack of judgment.

CORRECT USE OF INSTRUMENTS.

Are our cutting instruments to be used as ornaments? Not by any means. Burs, chisels, hatchets, and excavators by their very names alone tell their use. They are inert bodies, and must have power given them to do their work. A good and strong foundation is the only hope of success, and if we ever hope to

become operators we have to know how to use our instruments to advantage. Yet in all we do we must use brains. We should utilize our intelligence in filling teeth; our filling materials are only a means to an end, and without brains they are worthless.

FILLING MATERIALS AND CAVITY PREPARATION.

We have three kinds of filling material that recommend themselves by their permanence—porcelain, gold, and amalgam. I mention porcelain first because of its beauty and durability when placed where indicated, *i.e.* in the anterior teeth; yet there are anterior teeth that cannot be filled with porcelain with any hope of success. Such teeth are those that have become worn until they have an end-to-end bite. Here gold is indicated, service being the first object, regardless of beauty.

Porcelain. As to cavity preparation, porcelain requires a cavity without undercuts, clear, well-defined margins, allowing the matrix to draw easily and in no way become distorted. Good color and a proper bake will produce a result that justly evokes the operator's pride and the patient's delight. It is impossible to state how long porcelain should be fired; that depends on the furnace and the material used. Furnaces do not bake alike, even though of the same make. The matrix can be prevented from warping in large restorations by varnishing the margins. A better color and less brittle fillings can also be obtained by long bakes at a low temperature.

Gold. For gold inlays, cavity preparation is about the same as for porcelain inlays, only that margins are made broader.

For gold fillings good undercuts, strong walls, and clear margins extending to self-cleansing surfaces are required; all cavities should be extended to such surfaces, no matter what material is used. The gold should be packed in small pellets, annealed well, but never directly over the flame, and the finish should be made with No. 30 gage gold, which will give a splendid filling free from pits, and one that will not absorb the secretions.

Amalgam. Amalgam is one of the most difficult filling materials to manipulate properly, and for that reason alone so many poor amalgam fillings are made, though the best of amalgam may have been used. We find such fillings bulging, loose, discolored and discoloring the tooth, and in every conceivable condition caused by lack of knowledge in the manipulation of the material. Amalgam has a larger sphere than it is given credit for. There is hardly a tooth on which a gold crown is placed that cannot be beautifully restored with amalgam, giving comfort and permanence rarely found if gold crowns are employed. An amalgam filling should never be placed in an approximal cavity without using a matrix.

Silicate cement. You will notice that I have refrained from mentioning silicate cement as a filling material. My reason is that I do not class it as such. I have found from experience that it will not live up to the promises made for it. The fault may lie with me, yet I have been forced to discontinue its use.

CONCLUSION.

I could go into details as to cavity preparation, but will not, as I have found that one cannot obtain a very clear idea of such matters from a paper. No matter how well this subject may be presented, the little details are lost, and it is the little details in operative dentistry that make for success or failure. It is the clinic that broadens, and gives the real idea of how a certain work is performed. Description is never so good or forceful as actual demonstration. This is my reason for believing that few papers hit the bull's-eye. The gray matter of one observer is not so receptive as that of another. The majority of us are imitators, not inventors. We must see how a thing is done before we ourselves can do it. In conclusion, I would say that every filling, be it temporary or permanent, must be polished. Close attention must be paid to details, and the operator must

see to it that every piece of work leaves his hand in such a condition that he will not be ashamed to have it inspected by another.

Discussion.

Dr. M. S. Merchant, Houston, Texas. Dr. Storey gave his consent to read a paper very reluctantly. As he said, he is not trying to teach anything new in his paper, but wishes to make thoughtless men think. There are some points in his essay which are instructive to the oldest of us.

Dr. C. M. McCauley, Merkel, Texas. I should like to add a word of commendation to this paper on operative dentistry. If it does no more than teach us that thoroughness is of prime importance in the work of operative dentistry, we could expect no better lesson from a paper of that length. It is clear that the essayist is a careful and painstaking operator, who exercises judgment in his work.

If I were to take issue with regard to any point in the paper, I would do so with the statement that all cases of discoloration from amalgam fillings are caused by carelessness on the part of the operator. I do not believe this to be a fact. No doubt a great many cases are caused by failure to remove all the carious portions, or by imperfect condensation, which allows the carious process to continue. In such cases a space is soon created between the filling and the tooth structure, and discoloration results. In my judgment more of these cases are caused by the defective formulas which are followed in making the alloy. The filling contracts after it has been packed in the cavity and leaves a space for the entrance of such elements as will discolor the tooth structure. An amalgam containing a too small proportion of silver will contract. A silver-tin alloy containing less than seventy-two and one-half parts of silver will contract. An alloy which contains seventy-two and one-half parts of silver and twenty-seven and one-half parts of tin will neither contract nor expand, according to Dr. Black. I therefore believe that in a great many cases the discoloration around an amalgam filling is due to shrinkage of the mass, resulting from the manufacturer's error in putting in too little silver.

Dr. G. S. Staples, Sherman, Texas. While I commend my friend's paper, I do not agree with him in regard to the cause productive in the majority of cases of the discoloration of teeth filled with amalgam. In my opinion the majority of cases of discoloration of the teeth from amalgam is due to lack of carefulness. Many operators do not clean the tooth properly and do not prepare the cavity properly, because they are in too big a hurry to finish the filling and receive their dollar—which, I think, is the price the majority get for these fillings. I do not make any dollar fillings. I cannot do it and do myself justice. Only recently I was working for an old patient of mine, one of the leading lawyers in our city, when another patient came into the operating room and said that Dr. So-and-so would put in amalgam fillings for a dollar. My friend, on whom I was operating, said, "A man who would put in a filling for a dollar should not look in my mouth." That is my own sentiment. When an operator takes enough time to do this work carefully, there will be no more discoloration, which in my belief is generally caused by the operator, and not by the amalgam.

Dr. H. B. Holmes, Louisville, Ky. I am not a member of this association, but I am very glad of the opportunity to say how much I enjoyed Dr. Storey's paper. I came all the way from Louisville to attend this meeting, and I have enjoyed nothing that has come before the association since I have been here more than I have this paper. If this is the essayist's first effort, he has a brilliant future before him as a writer of essays. His paper is difficult to discuss because it is replete with axioms, and he is evidently not one of the men Dr. Staples spoke of who lack judgment.

The portion of the paper that interested me particularly was the subject of amalgams. Amalgam is one of our most permanent filling materials and the most terribly misused one. We see more faulty

amalgam fillings than porcelain or gold inlays. This is not always, however, the fault of the alloy, but lack of care and thoroughness both in the preparation and in the manipulation of the material. I hold that an amalgam filling should be condensed as thoroughly as we endeavor to condense gold fillings. If we do not use sufficient force on an amalgam filling, we may expect failure, it matters not what alloy we use. The essayist has pronounced another axiom when he said that we should never put an amalgam filling in the interproximal spaces without the aid of the matrix. Such a filling cannot be made successfully unless we have a supporting matrix.

Dr. Staples spoke of amalgam as being one of our fads. I do not agree with him that we should consider the use of amalgam and gold as fads. Amalgam is certainly one of the best materials we have. No dentist can afford to make proper amalgam fillings for a dollar, because in most instances two sittings are required, as the filling cannot be polished at the time it is inserted unless the patient remains for some time in the chair. The patient has to return for final polishing, which is very essential for the success of an amalgam filling.

Dr. Guy Morgan, Paris, Texas. One of the chief causes of failures of amalgam is the fact that dentists use amalgam fillings when they cannot use anything else—as, for instance, when the walls are too weak to hold any other filling, and when patients are not able financially to have better work done. For the latter reason, however, amalgam saves more teeth than any other filling material.

One feature, particularly, is of vast importance in the use of amalgam, *i.e.* these fillings should be polished and finished as carefully as gold fillings. Unfortunately hardly one man in five gives these fillings such careful attention. In a great many instances I have been able to give the patient excellent service by using this material instead of a gold crown, and a much better condition resulted than if a gold crown had been placed on the tooth. I wish to commend the essayist's paper very highly.

Dr. J. D. Towner, Memphis, Tenn. I wish to add my commendation of the papers of both Dr. Storey and Dr. Staples, as they both treat a similar subject. I wish to say of Dr. Storey's effort that it has impressed me that you have discovered a rising star in Texas, whom we should heartily encourage to future efforts.

There are two points in the paper that impressed me strongly: First, the essayist's strong advocacy of intelligent, honest, conscientious dental service, the discharge of the operator's moral obligation to the public, and of his honest duty to himself. Be conscientious, and above all things, be true to yourself! Two elements enter into dentistry, as distinct as they possibly can be—one is the purely professional and the other is the purely business feature. I mention this because some reference has been made to the consideration of fees. If you attempt to mix the two, you are going to make a failure of both. With the conscientious purpose in view of serving your patient to his best advantage, you yourself must be the sole judge of the recompense to be received for your efforts. You must be the master of the situation, and the patient has no right to dictate what the fee shall be. First settle the financial part, gain the confidence of the patient, and then resort to the operative procedure necessary. The moment you look into a cavity and see the dollar mark, you have invited failure before you touch an instrument to the tooth. Before you attempt any filling operation, study the conditions presented, as you cannot fill a tooth in one mouth in the same way as in another. If you operate regardless of the conditions present, those that will have an important bearing upon the permanence of your work, you become a mere mechanic. Any man who can pour sand in a rat-hole can fill a tooth, but he cannot fill it properly.

That brings us to the consideration of the operative procedure in amalgam work

as touched upon in Dr. Staples'. paper. I am an inlay advocate, and use gold and porcelain inlays almost exclusively. I do not make inlays because they are more easily made and bring a higher fee, but because I believe that an inlay properly made is the best filling possible, while, on the other hand, a poorly made inlay is absolutely the poorest excuse for a filling. If you are going to make an inlay, make it properly—you then have what is dependable and is a pride to yourself and your patient.

I especially wish to discuss the subject of amalgam. I make very few amalgam fillings, but when I do I exercise great care. Reference has been made to the discoloration of the filling material and the tooth structure. In view of the discoloration of the material, the operator should familiarize himself in his laboratory with the working properties of an amalgam before selecting it definitely. Amalgams mix differently; good formulas mix differently, and good formulas have different effects when used by different men; but one cause of discoloration lies in the condensation of the material in the cavity. The amalgam must be packed properly, and unless a pressure of forty pounds is produced with a flat instrument on every particle and every surface of that filling, it will not be perfect. The filling must be properly condensed, and is then less apt to be discolored than if it is slopped in. In mixing amalgam the same factors enter as in mixing cement, though not so much in regard to permanence as to form and discoloration. If in mixing amalgam an excess of mercury is avoided, and the material is well mixed and packed properly, the filling will retain its shape and will in many cases be permanent. That permanence will of course depend on the thoroughness with which the cavity has been prepared.

The main issue, however, is the discoloration of the tooth. If an amalgam filling is inserted into a thoroughly dehydrated cavity, it will not discolor the tooth. The trouble is that too many amalgam fillings are inserted without the proper exclusion of moisture. It is used too often like a submarine filling material, and, even though moisture is kept out to a certain extent, operators rarely go to the trouble of making the cavity as dry as it can possibly be made. Dryness must be obtained to avoid discoloration and also to prevent the slight disintegration of the tooth structure just underneath the contact layer of the filling. If you will remember these two things, you will have less trouble with amalgam fillings.

As to the polishing of the filling, no filling that is not polished is complete. Amalgam fillings must be polished as thoroughly as gold ones if the filling is expected to be as useful, as comfortable, and as permanent as it should be.

Dr. Pitt S. Turner, Belton, Texas. I wish to say a few words for the benefit of the young men present. I do the dental work for a large woman's college, and I see work from all over Texas, the South, and even some northern states, which brings up the question of cavity preparation as emphasized by Dr. Storey. The larger percentage of dentists, in my opinion, make proper cavity preparations, and I see in the mouths of these girls and young ladies gold fillings in cavities with a preparation that is perfection itself. I study these cavity preparations for my own benefit, as they show judgment, accuracy, and perfection. The fillings are finished in the same way. But I also often find amalgam fillings of such poor quality that if my office boy could not do better after a week's time in the office, I would dismiss him. That is a strong statement, and I believe I have made it once before on the floor of the Texas Dental Association, but yet it is true. And why? These amalgam fillings have been inserted in cavities that were not prepared with the same care, judgment, and painstaking effort used in the preparation of the cavities for gold, and therefore failure is the result. During the past session I have been strongly impressed by this observation, because no less than one dozen young ladies from that school have come to me with aching teeth that in every instance had been filled with amalgam just before

they left home. Usually in the bicuspids and molars the filling is left too full, the gingival border is left overhanging, the gum is being irritated, the tooth sore, and the cavity preparation faulty in every step. Yet, as I said before, in the same mouths I found gold fillings that any of us would be proud of.

I would advise the young men in the profession to be as thorough and as painstaking in the preparation of teeth for amalgam as if they were going to put in a diamond filling, and above all things not to leave the filling too full, so as to disturb the proper articulation. I have often found that the filling has been left bulging out in such a way that it looked like the top of a biscuit. Amalgam fillings must be finished as perfectly and with the same care as gold fillings.

Dr. Storey (closing the discussion). Gentlemen, I have hardly anything to say in closing, except that my heart is overflowing with gratitude for the manner in which my effort has been appreciated.

The next order of business was the reading of a paper by Dr. H. M. Davidson, Hubbard, Texas, entitled "Cavity Preparation for Gold Inlays," as follows:

Cavity Preparation for Gold Inlays.

Cavity preparation is one of the most important subjects the dentist is confronted with. A large percentage of our failures can be attributed to deficiency here. Whatever material be used, we should consider well the mechanical retention and the amount of stress that will be exerted by the occluding teeth.

MERITS OF THE GOLD INLAY.

As the gold inlay is one of my hobbies, I will confine myself to a discussion of the preparation of cavities for gold inlays. The gold inlay has a practical place in dentistry; it can be used to advantage, and when sound judgment is employed, no other modern method of filling can be compared with it, where properly indicated. I am sure that teeth are being filled with inlays where it should never be attempted. That, however, is the fault of the dentist and not of the method. The durability of the gold inlay has passed the experimental stage, as some men in our profession have been using this method for years. In one case I inserted an inlay eighteen years ago, and it is still in good condition today. There is no other available method that would have saved that tooth so well. I have used for years the Alexander method of burnishing platinum foil in the cavity and melting 22-k. gold plate without using a flux.

SOME MISTAKES.

It is not the intention of this paper to give the technique of the many methods that can be employed. I rather wish to call your attention to some of my mistakes. From these I hope the younger members of the profession, especially, will derive some benefit.

BEVELED MARGINS.

One of the mistakes I made at first was the preparation of cavities with square margins. I had been making porcelain inlays, and I would find myself preparing the cavities for gold inlays in the same way. The margins should be well beveled for a cast as well as a burnished filling. By making beveled margins I obtain a thin lap of gold that can be burnished to the tooth, so that there is practically no cement line. I have noticed that in shell crowns with perfect adaptation, when for some reason they had to be removed, the cement was almost as hard as stone, which is conclusive evidence to my mind that the gold inlay, if properly adapted, will give the same results.

OCCLUSION.

To my sorrow, I have made the mistake in some cases of letting the occluding teeth bear too hard on the inlay or abutment. The operator should be sure, after the cement has set and the

margins have been well burnished and polished, that no undue pressure is brought to bear on the inlay by any movement of the jaw.

GOLD INLAYS IN INCISORS.

We often find in anterior teeth that have carried a foil filling for years, that the cutting edge is worn down, and a part of the anchorage is worn away. These teeth offer an ideal place for a cast inlay. With a thin carborundum wheel the walls are made parallel and enough of the tooth on the lingual surface is ground away for anchorage, allowing the cavity to extend slightly over the incisal edge. I claim that there will be no more display of gold than there would be in a foil filling, a much better contact, and a wearing surface that cannot be excelled.

RESTORATION OF INTERPROXIMAL SPACES AND CONTACT POINTS.

Bicuspids and molars with badly broken walls that have moved together until all interproximal space is gone, I would separate if possible, and if I could not secure enough space, I would make a separation with base-plate gutta-percha and wait for months, if necessary, to get interproximal space and contact points.

GOLD INLAYS IN BICUSPIDS.

We often find bicuspids with caries on both sides, extending nearly through the tooth. Here I would true up the walls, grind off the cusps and bevel, and if the caries extended so deep that I should destroy too much tooth surface, I would dry the tooth, fill it with cement, and proceed to prepare it so as to encounter no trouble in withdrawing the pattern.

INLAYS AS ABUTMENTS.

I often use the inlay for abutments. I had a case two years ago, in which the upper right central and lateral incisors were missing, the left central was filled on both sides, and the canine was in the same condition. The lower teeth occluded very high up, which gave me plenty of room for the backings. I saw this case again a few days ago. There is very little display of gold, and no irritation at the gum line, as would have resulted from a Richmond attachment. The all-gold or window crown in such a place is a disgrace to the dental profession. There is less pain connected with the preparation of this class of cavities, as nearly all of the cutting can be done with stones. By using a high pressure of compressed air, there is very little pain.

NECESSITY OF DRYING THE CAVITY.

Another point I want to emphasize is the advantage of thoroughly drying cavities. I saturate the cavity with absolute alcohol and turn on 30 lb. of air for about two minutes. If you will pay more attention to this matter, you will have fewer loose inlays. My attention was called to it by one of the dental journals some time ago, in which it was stated that when an inlay came out, the cement would adhere to the gold and not to the tooth. I am sure that in such a case the cavity has not been thoroughly dried.

CONCLUSION.

This subject has been receiving the attention of the best men in our profession. This is not surprising, when we consider the great number of ill-fitting gold crowns that in the past have been inserted.

The next order of business was the report of the Committee on Pathology, Materia Medica, and Therapeutics, by the chairman, Dr. W. A. Dean, Tampa, Fla., as follows:

Report of Committee on Pathology, Materia Medica, and Therapeutics.

The Committee on Pathology, Materia Medica and Therapeutics begs to submit the following report:

To give a comprehensive report of any one of the three great branches named above would require more time than this body could give to its consideration. To treat them all, we necessarily have to touch briefly a few of the many features that require the careful study of all who are interested in the practice of dental surgery. That we have made rapid progress in our particular field within the past few years no one can gainsay, but that the field remains wide for a more thorough scientific investigation, particularly within the realm with which this committee has to do, is a fact that needs no emphasis with the thoughtful and well-informed practitioner.

THE ORAL PROPHYLAXIS MOVEMENT.

Just as many dread maladies have fallen before the rationalism of the science of general medicine, so will the many conditions of the dental organs and the oral cavity, which are no less a menace to the health and happiness of the race, give way to the science and skill of the dental and oral surgeon. The medical world today has not only banished forever the idea of heredity in the "great white plague"—phthisis—but has pronounced it curable. It has treated, empirically, "tropical anemia" for decades, and today "hook-worm" succumbs to well-directed or rational treatment. Just so are the many diseases of the oral cavity and dental organs to be controlled. Pyorrhea alveolaris, long pronounced as an incurable disease of the dental organs, is today at the mercy of the skilled hand and the rational therapeutist.

Our beloved associates, Drs. Corley, Walker, Towner, and Griffis are today knocking at the door of this association, standing at the threshold of the dental schools of this country, and pleading gently with the medical boards of every state in the Union for an audience in behalf of oral prophylaxis. This once given and the *régime* thoroughly instituted, with our students then not "ground out," but thoroughly equipped and "graduated" from our dental schools, particularly in the branches and allied branches with which this committee has to do, we will be approaching the goal toward which this association has been looking since the day of its organization.

It is the province of every dental surgeon or dental therapeutist not only to restore by artificial measures the lost organs in the dental arch, but to keep normal the natural teeth. The latter prerogative every thoughtful practitioner would say is the wiser course to pursue. To do this, we are forced to go beyond the cavity in the tooth—the mere physical sign that presents for our consideration.

Underlying the symptom is the cause, and we must find it if we are to attain to that perfection that is hoped for by the profession.

A BROADER DENTAL EDUCATION.

I have sought diligently to find the line of demarkation between "dental education" and that laid out for the student of general medicine, as regards these branches particularly, and I find that I cannot separate the two. In fact, in order to recognize the many pathological conditions that arise for which there is no visible cause, we must of necessity have some source from which we may derive a logical conclusion as to why such conditions obtain.

All cases, therefore, of dental disorders not attributable to unsanitary conditions or direct infection, we must admit are of constitutional origin, and must be fought on these grounds. Not only are some of the disease conditions of the teeth and the oral cavity of constitutional origin, but it is being made clearer to us each day that many of the constitutional ailments are directly traceable to the germ-life that has its culture medium in carious teeth. Until we recognize these conditions, at least as far as has been revealed both by the medico-dental investigator and the general practitioner, we may justly be called incompetents.

A specialist in any line must of necessity have a broader horizon than the circle in which he moves. He must have a

thorough knowledge of all subjects contiguous to the one with which he has to do, else he is handicapped, and grows narrow, with the result that he becomes a mere machine. Who can conceive of a criminal lawyer attempting that specialty without a knowledge of the fundamental principles that underlie all law? The farmer of today who knows not the composite element in which he plants his seed is living in the remote past, and is doomed forever to "horny hands."

In this connection my mind runs back to the principles advocated by the late J. Y. Crawford, and I am sure the solid South would turn an eager ear to this most loved of all our southern educators of dental surgery. Dr. Crawford taught that no specialist needed a more thorough knowledge of the fundamental principles of medicine than the doctor of dental surgery.

The average dental student of today has no higher ideal than to make "false teeth," plug the cavities that may present, make a bridge now and then, and possibly reach the high plane of skilfully constructing an orthodontia appliance. These are all well and good if the conditions demand them, and it is likely that in all ages we will find the need for them, but it is time for a higher ideal to be set up by those whose province it is to teach.

Along with the emphasis laid on mechanical and operative dentistry, let them give the students more prescription writing, a more thorough training in physical diagnosis; train them thoroughly in urinalysis, analysis of the oral secretions, etc., and the students will rise to a higher plane and will at once recognize the fallacy of plugging away, at the chair or in the laboratory.

RECENT DENTAL PUBLICATIONS.

Without wishing to make this too lengthy, I shall call attention briefly to a few of the articles and books that are of more than passing interest to us.

For our knowledge of the late publications we are indebted to our monthly magazines, all of which give a brief account of these books.

PRINZ'S DENTAL MATERIA MEDICA.

To satisfy our plea for more therapeutics, Dr. Hermann Prinz of St. Louis comes to us with a new book "Dental Materia Medica and Therapeutics, with Special Reference to the Rational Application of Remedial Measures to Dental Diseases." This is the first edition of this book. It is new, up-to-date, and is recommended to all who would keep abreast of the times. As the title of his book indicates, Dr. Prinz takes the rationalistic attitude in his development of the subjects within his book. This is in keeping with the rationalism that has almost revolutionized the older methods of the application of drugs.

MAYRHOFER'S BALSAM OF PERU TREATMENT FOR PUTRESCENT PULPS.

Another book which we are pleased to report to this body, is one by a German investigator and writer, Dr. Mayrhofer, dean of the University of Innsbruck, entitled "Principles of a Rational Therapy of Gangrene of the Pulp." He deals at length with the treatment of the root-canals and concludes that they will reinfect themselves from the tubuli, since the agents in use today lose their antiseptic and disinfectant qualities. From this point of view he criticizes Dr. Buckley's method of treatment with tricresol and formalin, but gives us a remedy, not yet verified by sufficient use to be perfect, but theoretically an ideal root-canal filling, especially in posterior teeth. He advocates balsam of Peru c. p. for the following reasons:

(1) It is a lasting antiseptic, (2) does not volatilize, (3) is not absorbed, (4) does not discolor the teeth, (5) is easy to introduce, (6) is easy to remove, and (7) has no irritant action on the tissues if it gets beyond the foramen.

BUCKLEY'S MATERIA MEDICA.

Dr. Buckley's book, "Materia Medica and Practical Therapeutics" (second edition), needs honorable mention in this connection. Dr. Buckley, having been

before the dentists of this country so long, needs no eulogy as to his ability as a writer and investigator. It has not been the pleasure of the chairman of this committee to see Dr. Buckley's book, nor a review of it by any of the journals, but we are all more or less acquainted with many of his treatments. We have the pleasure of reporting an article by him read before the Northeastern Dental Association, Providence, R. I., October 7, 1909. We reproduce the following formulas as given in that paper:

SOME USEFUL FORMULAS.

No. I. Devitalizing paste:

℞—Arsenic trioxid, 5j
Cocain, gr. xx
Thymol, gr. v
Lanolin, q. s. to make paste. M.

No. II. After-treatment before removing pulp:

℞—Menthol, gr. xx
Thymol, gr. xl
Phenol (95 per cent.), f5iij. M.

Thymol is used because of its favorable action on dead animal tissue. Buckley lets this dressing remain ten days, then removes it, and fills the canal.

Dressing for putrescent pulps.

No. III. Treatment for putrescent pulp, and abscessed teeth; the old "bone of contention" criticized by Dr. Mayrhofer in an article in which he referred to Dr. Buckley's method:

℞—Cresol,
Liq. formaldehyd, āā f5j. M.

This is designated by Dr. Buckley as a specific for putrescent pulps.

Bismuth paste for chronic abscesses.

No. IV. Another remedy, discovered by Dr. Beck of Chicago, but given in this connection by Dr. Buckley:

℞—Bismuth subnitrate, 30 per cent.
Vaselin, 60 " "
Paraffin, 5 " "
Wax, 5 " "
Mix while boiling.

This remedy is used in cases of chronic abscessed conditions that do not heal under the ordinary methods of treatment. In cases where the skiagraph shows denuded roots with no pericemental attachment in the apical region, instead of extraction the root can be amputated and the resultant pocket thoroughly curetted, and packed for a time with Euroform paste on gauze (another of Dr. Buckley's specifics) for the purpose of controlling the pain. After a sufficient time has elapsed the paste is removed and the subnitrate paste is forced into the cavity with a specially devised syringe. The syringe containing the paste should be warm so as to slightly soften the paste. Sufficient of the paste is forced into the cavity to fill it.

Euroform paste for pain from exposed processes and denuded surfaces.

The Euroform paste is given the following formula and is also classed as a specific by Dr. Buckley, its action being that of controlling pain resulting from exposed processes and denuded surfaces:

℞—Europhen,
Orthoform, āā 3j
Liq. petrolatum, q. s. to make paste.

"TECHNIQUE OF URINALYSIS."

"Technique of Urinalysis," another book to which I am pleased to call your attention, was written by another German author, Dr. Guttmann, a practicing dentist in Berlin. This author comes to the relief of this committee in its plea for a greater knowledge among dentists of the fundamental principles underlying the medical science. The DENTAL COSMOS, April 1910, says of it: "The recent advance in systemic diagnosis and treatment of dental diseases, and the close affinity between internal medicine and dentistry are authenticated in Dr. Guttmann's book, which in a convincing manner proves the necessity of a knowledge of urinalysis for the dentist."

Under the head of papers written es-

pecially for this meeting we are pleased to report the following:

(1) "Practical Dental Therapeutics," by Dr. H. B. Holmes, Louisville, Ky.

(2) "Clinical Experience and Observations in Pyorrhea Alveolaris," by Dr. W. O. Talbot, Biloxi, Miss.

The next item on the program was the reading of a paper by Dr. H. B. Holmes, Louisville, Ky., entitled "Practical Dental Therapeutics."

[This paper is printed in full at page 1217 of the present issue of the Cosmos.]

The secretary, Dr. Mason, presented a number of applications for membership, which on motion were accepted.

The next paper on the program, as announced by the President, was a paper by Dr. C. M. McCauley, Merkel, Texas, entitled "Oxyphosphate Cements."

[This paper is printed in full at page 1225 of the present issue of the Cosmos.]

Discussion.

Dr. B. F. Thielen, Paris, Texas. I want to congratulate the essayist on his paper, for it is a most excellent and timely one. His experiments show up some of these cements in a very bad light. We must admit that the ideal cement has not yet been formulated. We have thought we had it. Archite illuminated the dental firmament for a few hours, but like a meteor passed into darkness and oblivion. The silicate variety came heralded as the long-sought ideal filling material, but—a little while, and they, too, will pass to an untimely end, unloved and unsung.

Considering the various and complex conditions that exist in different mouths, I doubt whether an ideal cement will ever be discovered. The essayist has made some interesting tests for porosity, expansion, and contraction, which have their value, but can we say with absolute certainty that these phenomena will occur in the same way in all mouths with their differences in temperature, in reaction and chemical make-up of saliva? Until we can conduct these tests in the mouths of different individuals the question arises, Should we condemn a cement because it behaves in a certain way in pure water when placed in contact with red ink, which might perhaps contain some chemical that has a peculiar affinity for a combination such as these cements contain? I saw a patient the other day who has in her mouth two cement fillings that were put in seven years ago, and though they show some disintegration, they are practically in good condition and preserving the teeth. These fillings were made from a cement that the essayist's tests condemn. On the other hand, I have set porcelain inlays with the cement that makes the best showing, and seventy-five per cent. of them had to be reset.

I do not believe that cement will adhere better to a moist surface than to a dry one. My experience has been that I have greater success by maintaining absolute dryness. A cement may become as hard or harder in the presence of moisture, but it will not adhere as well, and when I set a porcelain inlay I put the rubber dam on, and after the cement has hardened, varnish the surface before allowing moisture to come in contact with it. When I set a gold inlay or crown or bridge, I wipe the cavity or abutments with alcohol, dry with hot air, and keep moisture away until the cement has set. I do not believe that we should depend on cement as a filling material, except in temporary operations.

The essayist's suggestions in regard to caring for the bottle and mixing the mass are excellent, and should be practiced.

I do not believe that the best results can be obtained by mixing cement on a paper pad, as I have seen some dentists do, but a heavy clean slab and a very strong stiff spatula should be used to thoroughly incorporate the powder with the acid.

I feel that we owe Dr. McCauley a vote of thanks for his work along this line, and I trust that he will be encouraged to continue it and at some future time make tests for adherence.

The next order of business was a paper by Dr. B. F. Thielen, Paris, Texas, entitled "The Duty of the Dentist—Is He Fulfilling It?"

The next order of business was a paper by Dr. W. O. Talbot, Biloxi, Miss., entitled "Clinical Experience and Observations in the Treatment of Pyorrhea Alveolaris."

[This paper was printed in full at page 851 of the August issue of the Cosmos.]

Discussion.

Dr. Howard T. Stewart, Memphis, Tenn. Dr. Talbot has long been known to us as an orthodontist and has frequently spoken on that subject before. A man who has given such long and extensive study to one particular branch of dentistry as Dr. Talbot has to orthodontia cannot be expected, generally speaking, to be equally capable in other branches. The essayist, however, seems to have been successful in all branches, and this paper, concise and to the point as it is, shows a practical knowledge of Riggs' disease that can come only with study and experience coupled with natural ability.

Nearly all of us differ as to minor points in the treatment of Riggs' disease, and some of us can accomplish results by one method, while our neighbor may obtain his best results from methods which we cannot use. All this has to be taken into consideration while discussing so-called scientific methods. This is possibly true to a greater extent in the treatment of Riggs' disease than in any other part of dental practice.

Dr. Talbot has touched on a subject —the intelligent extraction of teeth in Riggs' disease cases—upon which I intended to write a paper for this meeting, which, however, owing to an unexpected emergency, I did not have time to prepare.

To decide which teeth should be extracted and *when* they should be extracted in Riggs' disease is by no means an easy task, yet nothing in the entire treatment is more important. I would go farther, a good deal, than Dr. Talbot, and say that while my life-work, almost, in dentistry has been to save teeth affected with Riggs' disease, the more I see of final results the more strongly I am convinced that extraction, generally speaking, should be resorted to where there exists a doubt.

I say, generally speaking. This statement may come as a surprise to those who have seen the very extensive bridge work that I have for years been placing on seemingly frail supports. I have used roots of teeth with little bony tissue about them to support very extensive bridge work, and have often been severely criticized for so doing, but the continued good service which the majority of these teeth are doing proves the efficiency of this plan when the tissue about the teeth is healthy and when they are properly braced against any lateral strain or tilting leverage; in other words, when nearly all the force is directed as a straight push of the root into its socket. When this can be attained it is marvelous what force such teeth can withstand, and how they grow firmer under it all the time. Yet I wish to call attention to the fact that these teeth are not to be used when there is still a suspicion that unhealthy tissue is present about them. If lateral strain can be overcome, it is safer to risk a root that has four-fifths of its bony tissue gone with the remaining tissue firm and healthy, than to risk one which has four-fifths of its tissue remaining but in an unhealthy condition.

If, in a case where all or nearly all the teeth are still in the arch—the majority of these being fairly tight yet several quite advanced, though not in the last stages—the patient believes that you can save his teeth, because he has been told that you are an expert, it requires a great deal of courage to advise the extraction of several of those teeth. The patient is shocked. He says, "Why, doctor, I thought you could save my teeth!" It is a very hard matter to answer this. The patient must have a good deal of confidence in you, then, to allow you to extract six or eight teeth and place in bridge work. It is a great

temptation to try to save them all and put on splints.

The extraction of these teeth saves the patient the pain and annoyance of having these worst teeth operated on, and certainly has a salutary effect on the remainder of the teeth, greatly enhancing the chance for a permanent cure and giving the patient a far more satisfactory masticating apparatus by having bridge work solidly fastened to firm supports. Of course, no universal rule can be laid down, but when there are enough other teeth left to support bridge work firmly, doubtful teeth should almost invariably be extracted. It is certainly safer to err in this regard than to err by retaining the doubtful teeth. After all, in this as in all else in dentistry, common sense is the greatest of all virtues.

The question of extraction from a practical standpoint is of the greatest interest to all dentists. Dr. Talbot has not expressed himself at length in regard to extraction, but I know from personal discussion with him that he is in accord with my views on this subject.

The paper is a good one and while it is not extensive, it comprehends much in a few words, and shows the same careful thought and thorough investigation that characterizes Dr. Talbot in all his work.

The Clinic Committee, Dr. A. A. Dyer, Galveston, chairman, presented the following report:

Report of Clinic Committee.

The Clinic Committee begs to report as follows: Owing to the fact that only one member of the committee was present at this meeting, a short outline of all clinics will be impossible at this time, but the chairman of this committee will endeavor to obtain from each clinician a concise report of the work done, and a short outline of the same for publication in the proceedings.

The following is a list of clinics given:

(1) "Porcelain Jacket Crown" (showing complete restoration of cutting edge of a central incisor), by Dr. Julian Smith, Austin, Texas.

(2) "Restoration of Porcelain Crown Without Removal of Pins." Also, "Attachment for Regulating Appliance," by Dr. B. G. Atlee, Monterey, Mexico.

(3) "Seamless Gold Crown by the Sharp System," by Dr. J. P. Tingle, Elgin, Texas.

(4) "Casting Backings for Steele's Facings," by Dr. A. B. Carter, Garland, Texas.

(5) "Casting Device," shown by Dr. H. Clay Hassell, Tuscaloosa, Ala.

(6) "Metal Lining on Waxable Vulcanite," by Dr. W. G. Mason, Tampa, Fla.

(7)—chair clinic—"Oral Prophylaxis," by Dr. W. H. Scherer, Houston, Texas.

(8) "Showing Casts in Orthodontia," by Dr. J. A. Gorman, New Orleans, La.

(9) "Appliance for Reduction of Fracture in Inferior Maxillary," by Dr. J. M. Murphy, Temple, Texas.

(10) "Plastic Gold," by Dr. C. L. Alexander, Charlotte, N. C. (This was one of the most interesting clinics given and deserves special mention for careful preparation.)

(11) "X-ray Photograph and Models" (showing missing teeth), by Dr. T. G. Bradford, Dallas, Texas.

(12) "Casting Process Applied to Gold Shell Crowns," by Dr. J. Frank Clark, Rogers, Texas.

(13)—chair clinic—"Preparation of Cavity for Porcelain Inlay," by Dr. J. P. Arnold, Galveston, Texas.

(14) "Method of Making a 'Better Fit' in Artificial Dentures," shown by Dr. Geo. S. Staples, Sherman, Texas.

This concludes the list of clinics. Dr. Robert Good of Chicago, with whom arrangements had been made for a clinic on pyorrhea, was unable to attend the meeting. Though thirty-five clinics had been promised and placed on the program, only fourteen were given. It seems as though the energies of the committee have been to a large extent spent in vain.

The committee desires to extend its thanks to those who furnished clinics, and also to Dr. Chace, the president, who was very active in giving able assistance to the committee.

A. A. Dyer, Galveston,
Chairman Clinic Committee.

The meeting then adjourned until the evening session.

Friday—*Evening Session.*

The meeting was called to order at 8 o'clock Friday evening, May 6th, by the president, Dr. Chace.

The secretary *pro tem.*, Dr. W. G. Mason, read the minutes of the previous session, which were adopted as read.

The first item of the program as announced by the President was the reading of a paper by Dr. J. M. Weems, Sherman, Texas, entitled "Cleanliness in the Dental Office," as follows:

Cleanliness in the Dental Office.

On entering a dental office, the general appearance of neatness and cleanliness has great weight with your patients.

Your reception room should bear marks of gentility and have an atmosphere of cheerfulness, which to some extent may eliminate the dread that so many people have of a dental office; for it is probably of all places the last one to which people go as a matter of choice.

To do this, first, be careful in the selection of your wall paper. Avoid loud flashy colors; choose something that will be restful to the eyes and have a tendency to soothe disquieted nerves.

Second, let your furnishings be in keeping with your idea of repose. Hang a few choice pictures; scatter a few soft cushions. Supply your library table with late magazines, and last but not least, a few choice flowers, well arranged, are "emblematic of God's mercy" and a balm to some suffering soul.

Third, I should suggest a daily routine of dusting, of sterilizing instruments, and a change of doilies. The linen on your chair should be spotless and well preserved. Have your rooms well lighted, radiant with sunshine—itself a germ-killer. Your cuspidor should be carefully cleaned and never bear marks of a previous operation, also be kept free from odors.

All soiled napkins and disease-laden cotton rolls should at once have a receptacle, and all instruments should be kept from view, except a few for immediate use, and these must be well cared for. The others must have their places and be in easy reach of the operator. Medicine bottles should be well corked and dusted, or, better, wiped with a damp cloth. What is more objectionable than an office scented with odors from carelessly corked bottles, or what is more exasperating than to have your fingers clogged with dust when trying to alleviate some pain?

Quite often a dentist's work is judged by his surroundings, therefore you had better get busy and wake up to the general condition of your office! I have gone to these places and found them in a filthy condition and have been startled by having this apology offered me: "I know my office is not as clean as it should be, but leaving these soiled napkins, strips, and pellets around makes the new patients believe that I have been very busy."

Poor ignorant fool! He is not aware that the surroundings indicate the man, and again, that the man and his patrons are influenced by his surroundings.

No dentist can afford to be slovenly, either in person or in habits about his office. He should give no one cause to question his regard for hygiene and asepsis. To guard against this, he should impress indelibly upon his mind a single word, and daily apply it to everything in and about his office; it should be his watchword ever and anon—*cleanliness!*

Fourth, and last, employ an office girl to assist you in these arduous duties. In many ways she will repay you. Some lady patients object to calling on a dentist who does not employ a lady assistant. Then, too, as a rule she will be more careful than a man about the appearance of your rooms; she will keep

things sterile, and help to avoid a probability of inoculation.

We are servants of the public, we depend on the people for our existence, and we cannot command their respect unless we first respect ourselves. We cannot invite or control their patronage unless we maintain their confidence.

It was Dr. Osler who said, "You have one gospel to preach, and you have to preach it early and late, in season and out of season. It is the gospel of cleanliness of the mouth, of the teeth, and of the throat, and on these three things hangs the success of your life's work."

There is not one single thing more important to the public in the whole range of hygiene than "Oral Hygiene—The Hygiene of the Mouth."

The next order of business was the reading of a paper by Dr. J. O. Hall, Waco, Texas, entitled "Hot Water in Dentistry."

[This paper was printed in full at page 1082 of the October issue of the Cosmos.]

The treasurer, Dr. Brabson, then presented his report, which was referred to the Executive Committee for auditing.

Resolution on Oral Hygiene.

Dr. Julian Smith presented the following resolution:

Resolved, That we, the Southern Branch of the National Dental Association, indorse the work done by the Oral Hygiene Committee of the National Association, and record hereby our intention to give every possible assistance in the Oral Hygiene campaign.

The resolution was on motion adopted.

Dr. Corley, chairman of the Oral Hygiene Committee, then asked for donations from societies, resulting in the following amounts being pledged:

W. E. Walker—Louisana Society $50.00
M. S. Merchant—Houston Society 35.00
R. W. Carroll—Houston Society 25.00
H. C. Hassel—Tuscaloosa Society 25.00
J. M. Murphy—Central Texas Society. 15.00
J. P. Corley—Alabama Society (add'l) 10.00
H. W. Lubben—Galveston Society 25.00
J. P. Corley—Oral Hygiene Committee 15.00

Dr. J. P. Gray moved that the selection of the time and place of next meeting be left with the Executive Committee.

Motion carried.

Election of Officers.

The election of officers for the ensuing year was the next order of business and resulted as follows:

President—Dr. H. C. Hassell, Tuscaloosa, Ala.

First Vice-president—Dr. W. H. Scherer, Houston, Texas.

Second Vice-president—Dr. J. D. Towner, Memphis, Tenn.

Third Vice-president—Dr. H. M. Davison, Hubbard, Texas.

Treasurer—Dr. B. D. Brabson, Knoxville, Tenn.

Corresponding Secretary—Dr. W. G. Mason, Tampa, Fla.

Recording Secretary—Dr. W. A. Dean, Tampa, Fla.

Executive Committee (two new members)—Dr. J. P. Gray, Dr. R. W. Carroll.

Dr. Hassell, the president-elect, was then installed into office.

Dr. J. P. Corley moved that a rising vote of thanks be extended to Dr. Chace, the retiring president.

Motion carried.

Dr. Corley moved that the newspapers of the city be extended a vote of thanks for their courteous attention to the association during the meeting.

Motion carried.

Dr. Chace moved that the Houston Dental Society be extended a vote of thanks for their royal entertainment of the association.

Motion carried.

Motion was then made and carried to adjourn until the next annual meeting.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Forty-second Annual Meeting.

(Continued from page 1158.)

SECOND DAY—*Morning Session.*

President Nash called the meeting to order at 10.15 A.M.

The Secretary read the minutes of the last session, which were approved.

The Secretary stated that the committee of five appointed on Reorganization of the State Society according to the lines of the Illinois State Society, consisted of Drs. Wm. Carr, H. J. Burkhart, C. F. Baylis, F. C. Walker, and W. S. Rose.

The amendment to the by-laws, offered at the session of the previous day, was called up and adopted.

Dr. F. L. SIBLEY, chairman, read the report of the Committee on Necrology.

The next order of business was the Report of the Correspondent, Dr. H. C. FERRIS, Brooklyn, N. Y., as follows:

REPORT OF THE CORRESPONDENT.

Gentlemen,—In my last year's report as Correspondent I undertook the study of mastication and insalivation of foods in relation to the diseases of the stomach and intestines. This year I have gone one step farther in the digestive process, in the consideration of the pancreatic digestion, and have addressed to fifty pathologists of prominence in the world the following letter:

My dear Doctor,—The New York State Dental Society, U. S. A., earnestly solicits your opinion upon the following questions:

It is stated in all Human Physiologies that in animal experiments the pancreatic secretion performs the physiological function of saliva in its enzymic action upon starch.

I. Is this true, in man, without normal mastication and insalivation of his carbohydrates?

II. Can you present any proofs to verify your opinions?

May I ask the favor of an early reply to be incorporated in our annual report in May 1910?

Any courtesy you may extend will be greatly appreciated.

Very truly yours,

CORRESPONDENT.

To this letter I have received the following replies:

Dr. H. CARLTON SMITH, Harvard Dental School, department of chemistry, Boston, Mass.:

Dear Doctor,—Yours of the 15th regarding the action of the pancreatic secretion on starch received. In reply to the first question: "Is it true, in man, that without normal mastication the pancreatic secretion performs the physiological function of the saliva in the digestion of carbohydrates?" I would reply that it is undoubtedly true.

Your second question in regard to proofs; I should say that in addition to laboratory tests and animal experimentations we have a proof furnished by another department of the school in the feeding of infants. Before they have any teeth whatever, a solution of the feces shows starch to be wholly absent. Normal mastication could hardly be said to have taken place in these cases.

Respectfully,

H. CARLTON SMITH.

Bernard R. LeRoy, M.D., Athens, Ohio:

(Replies that he is carrying on research work, but is unable to answer the questions propounded in this report this year, but will be pleased to do so at a later period.)

Dr. Pullman, Offenbach a. M.:

My dear Doctor,—It is my experience that the pancreatic juice is strong enough to digest small quantities of starch in twenty-four hours, but is decidedly insufficient to digest the average starch meal consumed today by the people in the temperate zones.

Mastication and insalivation of the bolus, however, must begin before the bolus comes in contact with the pancreatic juice, and this is only possible and satisfactory when there are a sufficient number of molars in occlusion.

Baron Felix von Oefele, New York, N. Y.:

My dear Doctor,—In answer to your communication, I would state that there are numerous articles both in German and English publications upon this subject. It has been of great interest to me for the last twelve years.

"Question I." It is true that in animal experiments in test tubes the pancreatic secretion has a better, stronger, and more complete hydrolytic action on starchy digestion than saliva. But if salivary digestion of mankind does not act normally on the starch, the pancreatic secretion is never sufficient to digest this material. The undigested starch that remains partly ferments, and is accountable for pathological states—such as cardialgia, duodenal catarrh, fermentive lientery with air-bubbles.

"Question II." I have presented proofs in magazines from the results of 2000 very complete feces analyses. Dr. Pullman of Offenbach and Professor Michel of Wurzburg, and others, have made the same examination with the same results.

Further explanation under Question I. The dog is mostly used for physiological research work on digestion. For albumin and fat this animal serves well, but never for carbohydrates and starch. Mankind is omnivorous, the dog is carnivorous. The nature of the digestive secretion of mankind is adapted to albumin, fat, and carbohydrates; that of the dog to albumin and fat. Domestication has not in the least changed the nature of the dog's digestive apparatus. Molars [*i.e.* premolars] of dogs have not changed in their occlusal surfaces, even though they have been in domestic life for centuries, and the same is true of their ptyalin. Rabbits, guinea-pigs, and all other animals employed in physiological experiments eat in the wild or savage state grass, but not raw starch. Therefore it is understood that neither the salivary nor the pancreatic secretion of any of these animals has a very high value in starch digestion. Mankind from the most ancient times has eaten very few vegetables with starch. For the past three or four thousand years the carbohydrate diet has become the important factor in the north temperate zone.

The saliva and pancreatic secretion of animals has a certain amount of power of starch digestion, but the pancreatic secretion has a higher hydrolytic power. Raw starch can only be digested by pancreatic juice. The saliva has not enough power to hydrolyze unboiled starch, but if in the first chemical change sufficient water has entered the starch, from the boiling in the test tube, then either the saliva or pancreatic juice can make the further hydrolysis to a small extent. But in mankind this is not true. For the past three or four thousand years the average man has taken about four-fifths of a pound of starch daily.

This is a good food, but the amount is too high for the pancreatic secretion; therefore man is unable to eat large quantities of unboiled fruits and vegetables, but all foods which contain starch in large quantities are usually prepared by boiling. This is the custom throughout civilized countries, and is necessary. The amount of starch is so great that the pancreatic secretion is unable to care for it, and therefore, the starch must be fermented or boiled that the saliva may digest the boiled starch, and four-fifths of a pound daily is not too much for the saliva.

The saliva is mixed with the starch by the molars. The dog has no molars, only premolars. This shows a difference between mankind and the dog in salivary research. The premolars are necessary for the salivary action upon meat, the molars upon starch.

Proofs under Question II. About ten years ago I met Dr. Pullman. He had had a large experience and found that insufficient mastication and insalivation produced serious diseases of the digestive apparatus. I started in at that time to more completely study the feces analysis, and studied unmasticated residues of food in the feces and the coincidence with digestive troubles. Later I made a special study of microscopical residues of food, and especially of starch. I have

made over 2000 feces analyses in twelve years, and have found that, if the saliva contains a normal quantity of ptyalin, if the molars are present and the starchy food is well masticated, no undigested starch is seen in the feces.

If one of these points is insufficient, starch in the feces can be colored by iodin and seen with the microscope. It makes no difference whether the pancreatic secretion is normal or not. *If in a normal subject the function of mastication and insalivation has been performed, one hour after a starch meal the stomach contents will contain no starch for the analytic power of the pancreatic secretion to work upon; and if the saliva does not work, research on feces proves that the pancreatic secretion is insufficient.* This is seen by examination of stomach contents and feces.

I appreciate the importance of salivary analysis and the relation of the occlusion of the teeth as it bears upon digestion, but have given that work a consideration but secondary to my analyses of the feces, which is my specialty. I take pleasure in presenting my findings, however, to this society, that they may stimulate further research.

Respectfully submitted,

FELIX VON OEFELE, M.D.

Dr. J. CHRIST, Wiesbaden, Germany:

Gentlemen,—Your letter of the 28th received. My answer is that I have clinical experience which verifies Dr. Von Oefele's research work as to undigested starch in the feces in the absence of molars. The pancreatic secretion is not sufficient to digest food of insufficient division and insufficient insalivation.

But I disagree with him in this particular —that it is necessary to completely restore all the lost surfaces. My conviction is that a partial restoration of half the teeth, that is, facings, with proper habits on the patients' part, will accomplish the same results.

Prof. Dr. A. MICHEL, Würzburg, Germany:

My dear Doctor,—The questions in your kind letter of the 11th inst. are answered in a treatise which, under separate cover, I am sending you by the same mail.

If you have any doubts, I am still at your disposal.

Very truly yours,

A. MICHEL.

Following is the treatise referred to:

The Value of the Teeth in the Digestion of Food. By Prof. A. MICHEL, M.D., Director of the Royal Dental Institution, Würzburg.

(Read at the commemoration of the foundation of the Odontological Society of Frankfurt a. M.)

The odontological as well as the physiological books speak of the ingested food and explain that its digestion depends upon sufficient mastication, but they do not explain the reason why. I think that my colleague Gaudens was the first who occupied himself earnestly with the question—What must be considered as perfect mastication? or what degree of mechanical reduction of solid food should take place in a normal person to further digestion?

It should not be forgotten that mastication involves two preliminary, preparative stages of digestion. They are those of reduction and of impregnation with saliva; food thereby becomes soluble, and in addition there is the amylolytic power of the saliva, involving a separate process.

The shape and arrangement of the human teeth is proved by nature to be the most convenient for the reduction of the usual vegetable and meat foods.

Mastication consists of different acts. First the canine teeth tear a large piece of the food and cut it up. Occasionally the dorsal muscles help to split away larger pieces of food in the hand. Animal food is caught and masticated by the canines and bicuspids; muscle fibers, connective tissue, and fat are divided, but not ground. On the other hand, vegetables are immediately carried to the molars by the tongue, and are there correctly ground. These different teeth serve to divide very finely the vegetable food and to crack the cellulose covering which incloses its most nourishing part. But we also know that a great deal of food is introduced into the mouth in a reduced state, and yet we can not swallow it without vigorous mastication—for example, flour of toast or bread. Soft fruits, such as plums, can be swallowed. All persons, except the "bolters," masticate their food.

This proves that a great deal of food is masticated only for insalivation, but not for reduction. Of masticated white bread, 24 per cent. is converted into soluble sugar in one minute, and 39 per cent. in five minutes.

The saliva ferments are active for from ten to twenty-four minutes in the stomach, until they are neutralized by the stomach acids; this proves the exceedingly great im-

portance of insalivation, at least in starch food.

But there are a great number of rapid eaters, or "bolters," who swallow their food unmasticated. Various conditions produce this habit. Some people have not time enough for eating; others are nervous and always in a hurry, even in masticating; and again others are bolters from necessity—that is, they are compelled to swallow their food unmasticated because they have a reduced number of teeth. Only well-masticated and insalivated food is wet enough to be swallowed; therefore, people with an insufficient number of teeth form the habit of drinking while eating, or add a quantity of sauce to their food.

A reflex process of control takes place in the isthmus of the fauces, by which insufficiently prepared morsels are refused—that is, morsels that are not sufficiently soft and slippery.

This control of the bolus is more or less strong in different individuals. It may also be lost, by the exertion of the will or by habit, to such a degree that very large morsels can be swallowed without trouble. Such people are generally conscious of their bolting habits. They are frequently troubled with indigestion, and therefore prefer liquid foods such as marmalades, soups, and paps. Many of the bolters by compulsion, with an insufficient number of teeth, try to partly compensate this fault by retaining the food longer in the mouth and working with the tongue and cheek. The majority of these individuals, when asked, assert that they became bolters owing to dental trouble, toothache, bleeding gums, etc.

In most of such cases the stomach in the first years was healthy and caused no trouble, especially in wealthy people, who could eat more meat than vegetables. Dr. Von Oefele in connection with Dr. Kaeppel of Neuenahr, Germany, has proved very convincingly by fecal analysis that these people lose on an average 20 per cent. of their vegetable food, and that there is no difference between bolters and edentulous persons.

On reading this publication in the *Deutsche Zahnärztliche Wochenschrift*, 1902, I became very much interested in their findings. I met Dr. Von Oefele, and he asked me to take a hand in these researches, because they would be of the highest odontological interest. Consequently I took great pleasure in making fecal analyses, the results of which are stated below.

From the standpoint of physiology pure and simple it seems that the findings of Dr. Oefele and Dr. Kaeppel were not absolutely conclusive; but their work as published was careful and important enough to warrant my further research.

The people examined were divided into *masticators* and *bolters*—(*a*) Masticators with normal number of teeth; (*b*) Masticators with insufficient number of teeth. (*c*) Bolters with normal number of teeth; (*d*) Bolters with insufficient number of teeth.

Except in pathological cases we have no means of controlling the digestion in the stomach and the intestines, and therefore we cannot determine whether the peristaltic action together with the digestive juices reduces any unmasticated food. We can therefore observe only from the residues of undigested food as to which of the three factors, the teeth, the stomach, or the intestines, did not work sufficiently.

Analysis of feces alone can give conclusive information as to these conditions, and therefore I wish briefly to state what substances should be and may be present in normal feces which are controlled by the normal action of the teeth, the stomach, and the intestines. The feces are composed as follows: (1) Food residues—(*a*) Indigestible; (*b*) Digestible, but occasionally not absorbed. (2) Secretions of glands and of the walls of the intestines. (3) Products of decomposition. (4) Occasional ingredients.

If the fecal analysis is to be made in practice, we must know in advance what we wish to find and examine. It has been stated above that bolters or people with an insufficient number of teeth have less stomach or intestinal troubles when their diet consists chiefly of meats—that is to say, the digestion of meat, eggs, and cheese does not depend so much on reduction by the teeth and only to a small degree on insalivation. Therefore, the carnivora tear off large pieces, leaving further reduction and solution to the functions of the stomach and the lower intestines.

Consequently the absence of undigested particles of meat in the feces proves that people with an insufficient number of teeth, but with a healthy stomach and lower intestines can digest meat food, if it is not taken in excess. Connective tissue is dissolved by the stomach, muscle fibers and fatty substances by the intestines; therefore, the finding of connective tissue, muscle fibers, and fats indicates a faulty function of those organs.

This is not of so great import to the dentist, because meat which has been finely reduced outside of the mouth can be sufficiently

digested and resorbed. The dentist is specially concerned with the vegetable food, which contains partly albumin, partly fat, and partly carbohydrates. The vegetables which contain albumin and fat can be split up by boiling, this process continuing in the stomach and intestines. It is quite different, however, with the amylum cells. Their cellulose is also partly split up by boiling, but they must be mixed very freely with saliva in order that the amylum may be sufficiently absorbed. The truth of this statement is proved by the carnivora—for instance, by the cat. This animal swallows without masticating great pieces of meat nourishment; on the other hand, it takes pap of flour or millet only little by little, instinctively masticating it very carefully, especially with the posterior teeth. Thereby the parotid glands are stimulated; these then excrete a great deal of saliva. Primarily this food could be swallowed without trouble, but the animal insalivates it.

Three methods of examination in the analysis of the feces are available—(*a*) Macroscopical. (*b*) Microscopical. (*c*) Chemical.

For odontological purposes it is sufficient to search by chemical and microscopical examination for undigested starch.

Nothnagel ("Physiology of the Intestines," Berlin, 1874, page 90) and Noller (*German Journal of Biology*, 1897, page 291) have made the following statement, with which all other investigators in this subject agree:

"In healthy people with mixed diet we never observe characteristic isolated starch granules, save exceptionally in scraps and then disintegrated. Any increased amount of either kind must be called pathological."

Hulsbosch says: "I never have seen starch in the feces after the ingestion of potatoes, rice, or mature or immature seeds of legumes, if these foods were finely reduced and well masticated."

It is of the highest importance for the dentist, or rather for the dentist's patients, that it be demonstrated that the loss of starch—that is to say, an excessive amount of starch in the feces—is the result of defective molars, and that the percentage of starch in the feces stands in direct ratio to the number of molars missing.

My method of tabulating fecal examinations is here given:

PRELIMINARY DATA.

Name of the patient:
Feces of—January 7, 1904, 9 A.M.
Received: January 8, 1904.
Litmus reaction: Normally alkaline.

(A) MACROSCOPICAL EXAMINATION.

Consistence: Normal.	[Soft and shaped.]
Odor: Normal.	[Simple, feculent.]
Color:	[Light to dark brown.]
Residues of vegetables:	[Normally absent.]
Residues of meat:	" "
Mucus:	" "
Blood:	" "
Parasites:	" "
Concrements:	" "

(B) MICROSCOPICAL EXAMINATION.

Muscle Fibers:	[Occasionally.]
Starch:	[Normally absent.]
Fat globules:	[Normally absent.]
Cellulose:	[Present.]

I have made 77 feces analyses myself, and 30 have been made by my pupil Dr. Niederer (who was instructed by Dr. Von Oefele) and Dr. Kaeppel.

The examinations for starch were made in the following way: Starting with the macroscopical test the feces were mixed well with a glass rod. Then to one part of these well-mixed feces, distilled water was added to see if vegetable residues, concrements, and meat residues were present.

The consistence depends upon the amount of fat, mucus, and water present. For special research a small amount of the feces is mounted on a slide, and covered with a cover-glass.

On pressing the slide and cover-glass with the fingers, the mucus and fatty substances will be noticed to stay on the slide; feces containing a great deal of water, however, run all over the cover-glass.

We are chiefly interested, as I have stated, in the amount of starch present in the feces. A small piece of fresh feces of the size of a hempseed is pressed between the slide cover and the cover-glass; hard feces must be softened before making the slide, liquid feces must be evaporated. At first a thick layer is examined under the low power, then a thin layer under the high power. With a glass rod the feces are then mixed with a small quantity of Lugol solution; the starch granules will appear as bluish spots on the slide. It is necessary that the Lugol solution remain on the slide for from twelve to fifteen minutes before making the microscopical examination, for iodin is decolorized at first by the ammonium in the feces. If a high percentage of starch is present, often no reaction takes place. This is due to insufficient mastication, by which the cellulose membranes are not sufficiently opened,

Examination of Feces.—GROUP I: *Persons with sufficient teeth.*

NAME. *m*=masticator *b*=bolter	SET OF TEETH.	DATE OF EXAMINATION.	LITMUS REACTION.	COLOR.	MACROSCOPICAL EXAMINATION.			MICROSCOPICAL EXAMINATION.			
					Residue—vegetables.	Residue—meat.	Mucus.	Muscle fibers.	Starch.	Fat globules.	Cellulose.
1	– 7 6 5 4 3 2 1 — 1 2 3 – 5 6 7 8	11-28-03	al.	brown	*c*	. .	*d*	*e*	*c*	. .	*d*
F. M.	*m* – 7 – 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
2	8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8	11-29-03	"	d. brown	*c*	. . . .		*c*	*e*	. .	*d*
Major V.	*m* 8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
3	– 7 6 5 4 3 2 1 — 1 2 3 4 5 – – 8	11-29-03	"	"	*d*	. .	*d*	*c*	*b*	*d*	*c*
E. H.	*b* – 7 6 5 4 3 2 1 — 1 2 3 4 – – 7 8										
4	– 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8	11-30-03	"	lt. brown	. . . .		*d*	. .	*e*	*d*	*c*
H. W.	*m* – 7 – – – 3 2 1 — 1 2 3 4 5 6 7 –										
5	8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8	11-29-03	"	"	*b*	. . . .		*c*	*e*	*d*	*b*
J. K.	*b* 8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
6	– 7 6 5 4 3 2 1 — 1 2 3 – – 6 7 8	11-30-03	"	brown	.	. . .	. .	. .	*e*	. .	*b*
Mrs. F.	*m* 8 7 6 5 – 3 2 1 — 1 2 3 4 5 6 – –										
7	– 7 6 5 4 3 – 1 — 1 2 3 4 5 – 7 –	11-30-03	.	"	. .	. . .	. .	. .	*c*	. .	*d*
Miss R.	*m* – 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –										
8	8 7 6 5 4 3 2 1 — 1 – 3 – – 6 7 8	12-1-03	. .	"	. .	*d*	. .	*d*	*e*	. .	*d*
F. S.	*m* 8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
9	8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –	12-2-03	al.	d. brown	. .	*d*	. .	*c*	*b*	. .	*a*
F.	*b* 8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –										
10	8 7 6 5 4 3 2 1 — 1 2 3 4 – – 7 8	12-2-03	"	lt. brown	. . . .			. .	*e*	. .	*d*
F. N.	*m* 8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
11	8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –	12-2-03	"	d. brown	*d*	. .	. .	*d*	*e*	. .	*b*
G. M.	*m* 8 7 6 5 4 3 2 1 — 1 2 – 4 – – 7 –										
12	8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –	12-2-03	nt.	"	*d*	. .	. .	*d*	*e*	. .	*b*
K. M.	*m* 8 7 6 5 4 3 2 1 — 1 2 – 4 – – 7 –										
13	– – 6 5 4 3 2 1 — 1 2 3 4 – 6 – 8	12-3-03	al.	"	*c*	. .	. .	*c*	*e*	. .	*b*
A. M.	*m* – – 6 5 4 3 2 1 — 1 2 3 4 – 6 – 8										
14	– – 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8	12-4-03	"	"	*c*	*c*	*d*	.	*b*	*d*	*b*
A. M.	*b* – 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
15	– 7 6 5 4 3 2 1 — 1 2 3 – 5 6 7 –	12-7-03	"	"	. .	. . .	. .	. .	*c*	. .	*b*
B. L.	*m* – 7 6 5 4 3 2 1 — 1 2 3 – 5 – 7 –										
16	8 7 6 5 4 3 – – – – – 3 4 – 6 7 –	12-7-03	"	"	*c*	. .	. .	. .	*e*	. .	*d*
E. K.	*m* – 7 6 5 4 3 – – – – – 3 4 5 6 7 –										
17	– 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –	12-7-03	"	brown	*c*	. . .	. .	*d*	*e*	*d*	*d*
D.	*m* – 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –										
18	– 7 6 5 4 3 2 1 — 1 2 3 4 5 – – –	12-7-03	"	d. brown	*c*	. . .	. .	*b*	*e*	. .	*b*
J. W.	*m* 8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
19	– 7 6 5 4 3 2 1 — 1 2 3 4 5 – – –	12-10-03	"	"	*d*	*c*	. .	. .	*e*	. .	*b*
C. K.	*m* 8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
20	8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8	12-10-03	"	"	*d*	. . .	. .	. .	*e*	. .	*c*
M.	*m* – 7 6 – – 3 2 1 — 1 2 3 4 – – – 8										
21	– 7 6 5 4 – – – – 1 2 3 4 5 6 7 –	12-10-03	"	"	*b*	. . .	. .	*d*	*d*	. .	*d*
R.	*m* 8 7 – 5 4 3 2 1 — 1 2 3 – – – 7 8										
22	– 7 6 5 4 3 – 1 — – – 3 4 – – 7 8	12-12-03	"	"	*b*	*d*	. .	*d*	*b*	. .	*b*
K. M.	*b* – 7 6 5 4 3 2 1 — 1 2 3 4 5 – – 8										
23	– – 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –	12-12-03	"	"	*b*	*d*	. .	*d*	*b*	.	*b*
H. F.	*b* – – – 5 4 3 2 1 — 1 2 3 4 5 6 7 –										
24	– – – 5 4 3 2 1 — 1 2 3 4 5 6 7 –	12-12-03	"	lt. brown	*b*	*d*	. .	*c*	*b*	. .	*b*
E. M.	*b* – 7 6 5 4 3 2 1 — 1 2 3 4 5 6 – –										
25	– 7 – 5 4 – 2 1 — 1 2 3 – – 6 7 –	12-14-03	"	d. brown	*c*	*c*	. .	*c*	*e*	. .	*b*
R. S.	*b* – 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –										
26	8 7 6 – – – 2 1 — 1 2 3 4 5 6 7 –	12-16-03	"	lt. brown	*d*	. .		. .	*e*	. .	. .
Miss N.	*m* 8 7 – – – 3 2 1 — 1 2 3 4 5 6 7 –										
27	8 – 6 5 4 – – – – 1 – – 4 5 – 7 –	12-16-03	"	d. brown	*d*	. .	. .	. .	*e*	. .	*b*
F. O.	*m* 8 7 – 5 4 3 2 1 — 1 2 3 4 5 6 7 –										

GROUP I—*continued.*

NAME. *m*=masticator *b*=bolter	SET OF TEETH.	DATE OF EXAMINATION.	LITMUS REACTION.	COLOR.	MACROSCOPICAL EXAMINATION.			MICROSCOPICAL EXAMINATION.			
					Residue—vegetables.	Residue—meat.	Mucus.	Muscle fibers.	Starch.	Fat globules.	Cellulose.
28	8 – – 5 4 3 2 1 — 1 2 3 4 5 – – 8	12-16-03	al.	brown	. .	. .	. .	*d*	*d*	. .	. .
Sch.	*m* – 7 6 5 4 3 2 1 — 1 2 3 4 5 – 7 8										
29	8 7 – 5 4 3 – – – – – – 3 – 5 6 7 –	12-20-03	"	"	*c*	*d*	. .	*c*	*c*	. .	*d*
N.	*b* – 7 6 5 – 3 2 1 — 1 2 3 4 5 6 7 –										
30	8 7 – – 4 3 2 1 — 1 2 3 4 5 6 7 –	12-20-03	"	"	. .	. .	. .	. .	*c*	. .	*b*
D. R.	*m* 8 7 6 5 – 3 2 1 — 1 2 3 4 5 6 7 –										
31	8 – 6 5 4 3 – – – 1 – – 4 5 6 7 –	12-20-03	nt.	"	*b*	*d*	. .	*c*	*a*	. .	. .
Fr. B.	*b* – 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –										
32	8 7 6 – – 3 2 1 — 1 2 3 4 5 6 7 –	12-30-03	al.	d. brown	. .	. .	. .	. .	*c*	. .	*b*
R.	*m* 8 7 6 – – – 2 1 — 1 2 3 4 – – – 8										
33	8 – 6 – 4 3 2 1 — 1 2 3 4 5 6 7 –	12-30-03	nt.	lt. brown	*d*	*d*	. .	*d*	*d*	. .	. .
Miss D.	*m* 8 7 – 5 4 3 2 1 — 1 – – – – 6 7 8										
34	8 7 – – 4 3 2 1 — 1 2 3 4 5 6 7 –	12-30-03	"	"	*d*	. .	. .	*d*	*e*	. .	. .
K.	*m* – 7 6 5 4 3 – – – – – – 3 4 – 6 7 8										
35	8 7 6 – – – – 1 — – – – – 5 6 7 –	12-30-03	al.	"	. .	*d*	. .	*d*	*e*	. .	*b*
S.	*m* – – 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –										
36	8 7 6 5 4 3 2 1 — – – – 4 5 6 7 –	12-30-03	"	brown	*b*	*d*	. .	*c*	*c*	. .	*a*
St.	*b* 8 7 – – 4 3 – – – – – 3 4 5 6 7 –										
37	8 7 6 5 4 3 – – – 1 – 3 4 – – 7 8	12-30-03	"	"	*b*	. .	. .	*b*	*b*	. .	*b*
H.	*b* – 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –										

GROUP II: *Persons with insufficient teeth.*

38	– 7 6 – – – – 1 — – – 3 4 5 – 7 –	11-16-03	al.	d. brown	*d*	*c*	*d*	*d*	*a*	. .	*b*
F. W.	*m* – – – 5 4 3 2 1 — 1 2 3 – – 6 7 –										
39	– 7 6 – – 3 – – – – – – 3 4 5 – – –	11-20-03	"	"	*d*	*c*	. .	*d*	*b*	. .	*b*
H. H.	*m* – 7 6 5 4 3 2 1 — 1 2 3 – – 6 7 –										
40	– 7 – 5 – – – – – – – 3 4 – – – –	11-22-03	"	brown	*d*	*d*	. .	*b*	*a*	. .	*a*
O.	*b* – – – – – 3 2 1 — 1 2 3 – 5 6 – –										
41	– 7 6 – – – – – — – – – – 6 7 –	11-29-03	"	"	*d*	*d*	. .	*c*	*a*	. .	*b*
H.	*b* – 7 6 – – 3 2 1 — 1 2 3 4 5 – – –										
42	– – – 5 4 3 2 1 — 1 2 3 – – 6 7 –	11-29-03	"	d. brown	*d*	*d*	. .	*c*	*a*	. .	*b*
K.	*b* – – – – – 3 2 1 — – – 3 4 5 6 – –										
43	8 – – 5 4 3 – 1 — 1 2 3 – – – – 8	12-4-03	"	"	*d*	*d*	. .	*b*	*a*	. .	*b*
S. F.	*b* 8 – – – – 3 2 1 — – – – – – – – –										
44	– 7 6 – – 3 – – – – – 3 4 5 6 – –	12-4-03	"	"	*c*	*c*	. .	*b*	*b*	*d*	*a*
J. Th.	*m* – 7 – – – 3 – – – 1 – 3 – 5 – 7 –										
45	– 7 6 – – 3 2 – – – – 3 – – – 7 –	12-4-03	"	brown	*c*	*c*	. .	*b*	*b*	*d*	*a*
E.	*b* – 7 6 – – 3 – 1 – – – 2 3 – 5 – – –										
46	– – 6 5 4 – – – – 1 2 3 4 5 – – –	12-4-03	nt.	"	*c*	*c*	. .	. .	*a*	. .	*a*
Sch.	*m* – – – 5 4 3 2 1 — 1 2 3 – – – – –										
47	– 7 6 – – – 2 1 — – – 3 – – 6 – –	12-10-03	al.	"	*d*	*d*	. .	*d*	*d*	. .	*a*
J. K.	*b* – – 6 – – 3 2 1 — 1 2 3 – – – – –										
48	– 7 6 – – – 2 1 — 1 – – – – – 7 –	12-18-03	"	"	*d*	*d*	. .	*b*	*a*	. .	*b*
H.	*b* – – 6 – – 3 2 1 — – – – – – – – –										
49	– – – – – – 2 1 — 1 2 3 4 5 – – –	12-29-03	"	"	*d*	*a*	. .	*b*	*a*	*b*	*b*
H.	*b* – 7 – – – 3 2 1 — 1 2 3 4 5 – – –										
50	8 – – – – – – – – – – – – – – – 8	12-20-03	"	"	*d*	*a*	. .	*b*	*a*	. .	*a*
M.	*b* 8 7 – – – 3 2 1 — 1 2 3 – – – – 8										
51	– 7 – – – – – 1 — – – – 3 4 5 – – –	12-31-03	"	d. brown	*d*	*d*	. .	*b*	*a*	*d*	*b*
St.	*b* – – – – – 3 – 1 — – – 3 – – – 7 –										
52	– 7 6 – – – – – — – – – – – 6 7 –	12-31-03	"	"	. .	. .	. .	*d*	. .	. .	*b*
Sch.	*m* – – – – 3 2 1 — 1 2 3 – – – – –										

GROUP III (A): *Before prosthesis.*

NAME. *m*=masticator *b*=bolter	SET OF TEETH.	DATE OF EXAMINATION.	LITMUS REACTION.	COLOR.	MACROSCOPICAL EXAMINATION.			MICROSCOPICAL EXAMINATION.			
					Residue—vegetables.	Residue—meat.	Mucus.	Muscle fibers.	Starch.	Fat globules.	Cellulose.
53	– – 6 – – – – – – — – – – 4 5 6 – –	11-24-03	al.	dark	*a*	*d*	. .	*c*	*a*	. .	*a*
Sch. E. *b*	– – – – 4 3 2 1 — 1 2 3 4 – – – –										
54	– – – – – 3 – – – – – 3 – – – – –	11-24-03	"	"	*a*	*d*	. .	*c*	*a*	. .	*a*
Fl. E. *b*	– – – – – 3 2 1 — 1 2 3 – – – – –										
55	– – – 5 – 3 – – – – – 3 – – – – –	11-29-03	"	"	*a*	*d*	. .	. .	*a*	*c*	. .
L. A. *m*	– – – – – 3 2 1 — 1 2 3 – – – – –										
56	– – – – – – – – – — – – – – – –	12-7-03	"	"	*a*	*d*	. .	. .	*b*	. .	*a*
L. K. *m*	– – – – – – – – – — – – – – – –										
57	– – – – – 3 – – – – – 3 – – – 7 –	12-7-03	"	lt. brown	*a*	*b*	*d*	*c*	*b*	*c*	*a*
M. J. *b*	– – 6 5 4 3 2 1 — 1 2 3 – – 6 7 8										
58	– 7 6 – – – – – – – – – 5 6 7 –	12-7-03	"	d. brown	*a*	*d*	. .	*c*	*b*	. .	*a*
Gl. A. *b*	– – – 5 4 – 2 1 — 1 2 3 4 5 – – –										
59	– – 6 – 4 3 – – – – – 3 4 – 6 – –	12-12-03	"	brown	*b*	. .	. .	*c*	*b*	. .	*a*
M. F. *b*	– 7 6 5 4 3 2 1 — 1 2 3 4 – – 7 –										
60	– – – – – – – – – — – – – – – –	12-12-03	"	lt. brown	*b*	. .	*c*	. .	*a*	*c*	*a*
B. H. *m*	– – – – – – – – – — – – – – – –										
61	– – – – – – – – – — – – – – – –	12-20-03	"	"	*b*	*d*	*c*	*d*	*a*	*c*	*a*
M. A. *m*	– – – – – – – – – — – – – – – –										
62	– – – 5 – 3 – – – – – 3 – – – – –	12-27-03	. .	brown	*a*	*d*	*c*	. .	*b*	. .	*a*
B. J. *m*	– – 6 5 4 3 2 1 — 1 2 3 4 5 6 – 8										
63	– – – 5 – 3 – – – 1 – 3 – – 6 – –	12-27-03	. .	"	*a*	*e*	. .	*d*	*a*	. .	*a*
K. S. *m*	– – – 5 4 3 2 1 — 1 2 3 4 5 – – –										
64	– 7 – – – – – – – – – – – 6 – –	1-3-04	. .	"	*b*	*b*	. .	. .	*a*	*c*	*a*
L. A. *b*	– – – – 4 3 2 1 — 1 2 3 4 – – – –										
65	– 7 – – – 3 – – – – – 3 4 5 – – –	1-5-04	. .	"	*a*	*b*	. .	. .	*a*	. .	*a*
V. W. *b*	– – – – – 3 2 1 — 1 2 3 – – – – –										

GROUP III (B): *After prosthesis.*

53 *	– – 6 *5 4 3 2 1* — 1 2 3 4 5 6 – –	1-4-04	al.	dark	*b*	. .	. .	*d*	*c*	. .	*b*
Sch. E. *b*	– – *6 5 4* 3 2 1 — 1 2 3 4 *5 6* – –										
54	– – *6 5 4* 3 – – – *1 2* 3 *4 5* – – –	1-4-04	"	"	*b*	. .	. .	*d*	*c*	. .	*b*
Fl. E. *b*	– – *6 5 4* 3 2 1 — 1 2 3 *4 5 6* 7 –										
55	– – *6 5 4* 3 *2 1* — *1 2* 3 *4 5 6* 7 –	1-1-04	"	"	*b*	. .	. .	*d*	*c*	*c*	*b*
L. A. *m*	– – *6 5 4* 3 2 1 — – 2 3 *4 5 6* – –										
56	– – *6 5 4* 3 2 1 — *1 2* 3 *4 5 6* 7 –	1-1-04	"	"	*b*	. .	. .	*d*	*d*	. .	*b*
L. K. *m*	– – 6 5 4 3 2 1 — 1 2 3 *4 5 6* 7 8										
57	– 7 6 *5 4 3 2 1* — *1 2 3 4* 5 6 7 –	1-2-04	nt.	brown	*b*	. .	. .	. .	. .	. .	. .
M. J. *b*	– – *6 5* 4 3 2 1 — 1 2 3 4 5 – – –										
58	– – 6 *5 4 3 2 1* — *1 2* 3 4 *5 6* – –	1-21-04	"	"	*b*	*d*	. .	*d*	*d*	. .	*b*
G. A. *b*	– 7 6 – 4 3 2 1 — 1 2 3 4 *5 6* 7 –										
59	– *7 6 5 4 3 2 1* — *1 2 3 4 5 6* 7 –	1-21-04	al.	"	*b*	. .	. .	. .	*b*	*c*	*b*
M. F. *b*	– *7 6 5 4 3 2 1* — *1 2 3 4 5 6* 7 –										
60	– *7 6 5 4 3 2 1* — *1 2 3 4 5 6* 7 –	2-26-04	"	d. brown	*b*	. .	*d*	. .	*b*	. .	*b*
B. H. *m*	– *7 6 5 4 3 2 1* — *1 2 3 4 5 6* 7 –										
61	– – *6 5 4 3 2 1* — *1 2 3 4 5 6* – –	2-26-04	nt.	dark	*b*	. .	*d*	. .	. .	*c*	*b*
M. A. *m*	– – 6 5 4 3 2 1 — 1 2 3 4 5 6 – 8										
62	– – – *5 4 3 2 1* — 1 2 3 *4 5* – – –	2-26-04	al.	"	*b*	. .	. .	*c*	. .	. .	*b*
B. J. *m*	– – – 5 4 3 2 1 — 1 2 3 4 5 – – –										
63	– *7 6 5 4 3 2 1* — *1 2 3 4 5* 6 – –	2-29-04	"	"	. .	. .	. .	. .	*d*	. .	*b*
K. S. *m*	– *7 6 5 4* 3 2 1 — 1 2 3 4 *5 6* – –										
64	– *7 6 5 4 3 2 1* — *1 2 3 4* 5 6 – –	3-3-04	"	lt. brown	*b*	*d*	. .	*c*	. .	*c*	*c*
L. A. *b*	– – *6 5 4* 3 2 1 — 1 2 3 *4 5 6* – –										
65	– – *6 5 4 3 2 1* — *1 2 3 4* 5 6 – –	3-10-04	"	brown	*b*	. .	. .	*c*	*d*	. .	*b*
V. W. *b*	– – *6 5 4 3 2 1* — *1 2 3 4 5 6* – –										

* The *italic* figures represent the artificial teeth.

GROUP IV: *With ample prosthesis, yet meager digestion of starch.*

NAME. *m*=masticator *b*=bolter	SET OF TEETH.	DATE OF EXAMINATION.	LITMUS REACTION.	COLOR.	MACROSCOPICAL EXAMINATION.		MICROSCOPICAL EXAMINATION.				
					Residue—vegetables.	Residue—meat.	Mucus.	Muscle fibers.	Starch.	Fat globules.	Cellulose.
66	7 6 5 4 3 2 1 — 1 2 3 4 5 6 7	12-26-03	al.	dark	*b*	*b*	. .	*b*	*b*	. .	*b*
B. J. *b*	7 6 5 4 3 2 1 — 1 2 3 – 5 6 7										
67	7 6 5 4 3 2 1 — 1 2 3 4 5 6 7	12-27-03	"	"	*b*	*b*	. .	*b*	*b*	. .	*b*
A. *b*	7 6 5 4 3 2 1 — 1 2 3 4 5 6 7										
68	7 6 5 4 3 2 1 — 1 2 3 4 5 6 –	11-31-03	"	lt. brown	*b*	*b*	. .	*b*	*b*	. .	*b*
Th. L. *b*	– 6 5 4 3 2 1 — 1 2 3 4 5 6 7										
69	– 6 5 4 3 2 1 — 1 2 3 4 5 6 –	1-6-04	nt.	dark	*b*	. .	. .	*b*	*b*	. .	*b*
U. F. *b*	– 6 5 4 3 2 1 — 1 2 3 4 5 6 7										
70	– 6 5 4 3 2 1 — 1 2 3 4 5 6 7	1-9-04	"	"	*b*	*d*	. .	*b*	*b*	*d*	*b*
B. N. *b*	7 6 5 4 3 2 1 — 1 2 3 4 5 6 7										
71	7 6 5 4 3 2 1 — 1 2 3 4 5 6 7	1-12-04	al.	"	*b*	*c*	*b*	*b*	*b*	*d*	*b*
R. Fr. *m*	7 6 5 4 3 2 1 — 1 2 3 4 5 6 7										
72	7 6 5 4 3 2 1 — 1 2 3 4 5 6 7	1-14-04	nt.	lt. brown	*d*	. .	. .	*b*	*b*	. .	*b*
S. J. *b*	7 6 5 4 3 2 1 — 1 2 3 4 5 6 7										
GROUP V (A): *With prosthesis.*											
73	– 6 5 4 3 2 1 — 1 2 3 4 5 6 7	12-2-03	al.	dark	*c*	*d*	. .	*b*	*d*	. .	*b*
L. H. *m*	– 6 5 4 3 2 1 — 1 2 3 4 5 6 –										
74	– 6 5 4 3 2 1 — 1 2 3 4 5 6 –	1-9-04	"	"	*b*	*d*	. .	*d*	*d*	. .	*b*
W. K. *m*	– 6 5 4 3 2 1 — 1 2 3 4 5 6 –										
75	7 6 5 4 3 2 1 — 1 2 3 4 5 6 7	2-16-04	"	"	*c*	*d*	. .	*d*	*c*	. .	*b*
M. K. *m*	7 6 5 4 3 2 1 — 1 2 3 4 5 6 7										
76	– 6 5 4 3 2 1 — 1 2 3 4 5 6 –	3-16-04	"	"	*b*	*c*	. .	*b*	. .	. .	*a*
L. E. *m*	– 6 5 4 3 2 1 — 1 2 3 4 5 6 –										
77	7 6 5 4 3 2 1 — 1 2 3 4 5 6 –	3-20-04	nt.	brown	*c*	. .	. .	*c*	. .	. .	*a*
Sch. F. *m*	7 6 5 4 3 2 1 — 1 2 3 4 5 6 –										
GROUP V (B): *Without prosthesis.*											
73	– – – 5 4 – – – — – – – – – 7 –	11-27-03	al.	dark	*c*	*d*	. .	*a*	*a*	. .	*a*
L. H. *m*	– – – – – 3 2 1 — – – – 4 5 – – –										
74	– – – – – – 2 1 — 1 2 3 – – – – –	11-4-03	"	"	*b*	*c*	. .	*a*	*a*	. .	*a*
W. K. *m*	– – – – – 3 2 1 — 1 2 3 – – – – –										
75	– – – – – – – – — – – – – – –	1-2-04	"	lt. brown	*b*	*c*	. .	*b*	*a*	. .	*a*
M. K. *m*	– – – – – – – – — – – – – – –										
76	– – – – – – – – — – – – – – –	2-12-04	"	"	*b*	*d*	. .	*b*	*a*	. .	*a*
L. E. *m*	– – – – – – – – – – – – – – –										
77	– 7 – – – – – – — – – – – 6 – –	3-17-04	nt.	dark	*c*	*c*	. .	*a*	*b*	. .	*a*
Sch. F. *m*	– 7 – – – – – – — – – – – 5 – –										
SUPPLEMENTARY SERIES (Dr. Niederer's).											
1	– – – – – 3 – – – 1 2 3 4 5 6 – –	8-24-02	ac.	gray	*a*	. .	. .	*a*	*a*	. .	*b*
A. *m*	– – 6 5 4 3 2 1 — 1 2 3 4 5 6 – –										
2	8 7 6 5 4 3 2 1 — 1 2 3 4 – 6 – –	7-8-03	al.	brown	*d*	. .	. .	*d*	*a*	. .	*b*
F. *b*	– 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –										
3	– – – – – – – – — – – – – – –	7-28-03	"	"	. .	. .	. .	*b*	*d*	. .	*b*
F.	— – – – – – – – — – – – – – –										
4	– 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –	7-21-03	nt.	yellow	. .	. .	. .	*a*	*b*	. .	*b*
B.	— – 7 – 5 4 3 2 1 — 1 2 3 4 5 6 7 –										
5	– 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –	7-4-03	al.	lt. brown	. .	. .	. .	*c*	*b*	. .	*b*
B.	— – 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 –										

SUPPLEMENTARY SERIES—*continued.*

NAME. *m*=masticator *b*=bolter	SET OF TEETH.	DATE OF EXAMINATION.	LITMUS REACTION.	COLOR.	MACROSCOPICAL EXAMINATION.			MICROSCOPICAL EXAMINATION.			
					Residue—vegetables.	Residue—meat.	Mucus.	Muscle fibers.	Starch.	Fat globules.	Cellulose.
6	- 7 6 - 4 3 2 1 — 1 2 3 4 5 6 7 -	. . . . .	al.	br. gr'n	*b*	. . .		*b*	*a*	. .	*b*
B.	— 8 - 6 5 4 3 2 1 — 1 2 3 4 5 - - 8										
7	- *7 6 5 4 3 2 1* — - *2 3 4* - *6 7* -	. . . . .	nt.	br. yel.	. . .	. . .	. . .	*b*	*a*	. .	*b*
B.	— - - - - - 3 2 - - — 1 2 - - - - - -										
8	- - 6 5 4 3 2 1 — 1 2 3 4 5 6 - -	. . . .	al.	brown	. . .	. . .	. . .	*d*	*a*	. .	*b*
A.	— 8 7 - 5 4 3 2 1 — 1 2 3 4 5 - 7 8										
9	- - - 5 4 3 2 1 — 1 2 3 4 5 - 7 -	. . . . .	"	"	. . .	. . .	. . .	*c*	*a*	. .	*b*
A.	— - - - 5 4 3 2 1 — 1 2 - 4 5 - - -										
10	- - - - - 3 - - - - - - 3 - - - - -	8-12-03	"	"	. .	. .	*d*	*d*	*d*	. .	*b*
A.	— - - - - 4 3 2 1 — 1 2 3 4 - - - -										
11	8 - - - - - 2 1 — - 2 3 - 5 - 7 -	6-16-02	"	lt. yel.	. . .	. . .	. . .	*b*	*a*	. .	*b*
F. Fr.*	— 8 7 - 5 4 3 2 1 — 1 2 - - - - 7 -										
12	8 - - *5 4 3* 2 1 — 1 2 3 *4 5* 6 7 -	9-14-03	al.	brown	. .	. .	. .	*c*	*b*	. .	. .
F. Fr.†	— 3 - - *5 4* 3 2 1 — 1 2 *3 4 5* - 7 -										
13	8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8	. . . . .	nt.	"	. .	. .	. .	*b*	*a*	. .	. .
H. Hr. S.	*b* 8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
14	8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8	. . . . .	al.	"	*d*	. . .	. .	*d*	. .	. .	. .
L.	*b* 8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
15	- - - 5 - 3 2 1 — 1 2 3 4 - 6 - -	. . . . .	"	yel. br.	*a*	. . .	. .	*d*	*a*	. .	. .
L	— - - 6 5 4 3 2 1 — 1 2 3 - - - - -										
16	- 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8	. . . . .	"	br. yel.	*b*	. . .	. .	*d*	*a*	. .	. .
Sch.	— - 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
17	- - - - - 3 - - - - - - - 5 6 - -	. . . . .	nt.	brown	*d*	. . .	. .	*b*	*a*	. .	. .
Sch.‡	— - - - 5 4 - 2 - — 1 2 3 - - - - -										
18	8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 8	. . . . .	al.	red br.	*b*	. . .	. .	*b*	*b*	. .	. .
Sch.	*b* - - - - 4 3 2 1 — 1 2 3 4 5 - - -										
19	- - 6 5 - 3 2 1 — 1 2 3 - 5 6 - -	. . . . .	"	brown	*a*	. . .	. .	*d*	*a*	. .	. .
R.	— - - - 5 4 3 2 1 — 1 2 3 4 - - - -										
20	8 7 6 - - 3 2 1 — 1 2 3 4 5 6 7 -	. . . . .	nt.	"	*b*	. . .	. .	*b*	*a*	. .	. .
R.	— 8 - - 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
21	- - - *5 4 3 2 1* — *1 2 3 4 5 6* 7 -	8-22-03	ac.	gr'n yel.	. . .	. . .	. .	*b*	*a*	. .	. .
R.	— - - - 5 4 3 2 1 — 1 2 3 4 - - - -										
22	- - - 5 4 3 2 1 — 1 2 - - 5 - 7 -	7-28-03	al.	brown	. . .	. . .	. .	*a*	*a*	. .	. .
P.	- - - - 4 3 2 1 — 1 2 3 4 5 6 7 -										
23	- 7 6 5 *4* 3 2 1 — *1 2 3 4 5* 6 - -	8-28-03	al.	"	*b*	. . .	. .	*d*	*a*	. .	. .
N.	— - - - 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
24	- - - - - 3 2 1 — 1 2 - - - - - -	7-22-03	nt.	gr'n br.	*c*	. . .	. .	*b*	*a*	. .	. .
S.	— 8 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 -										
25	- 7 6 5 4 3 2 1 — 1 2 3 4 5 - 7 8	8-9-03	ac.	gray	*b*	. . .	. .	*a*	*a*	. .	. .
K.	*b* - 7 - 5 4 3 2 1 — 1 2 3 4 5 6 7 8										
26	- 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 -	. . . . .	al.	green	*d*	. . .	. .	*b*	*a*	. .	. .
K.	— 8 7 6 - 4 3 2 1 — 1 2 3 4 5 6 7 8										
27	- - - - - - 3 - - - - - - 3 - - - - -	8-18-03	"	d. green	*d*	. . .	. .	*b*	*a*	. .	. .
K.	— - - - - - - 2 1 — 1 2 3 4 5 - - -										
28	- 7 6 5 4 3 2 1 — 1 2 3 *4 5 6* 7 8	7-23-03	"	br. gr'n	. . .	. . .	. .	*d*	*b*	. .	. .
H.	— - 7 6 5 4 3 2 1 — 1 2 3 4 5 6 7 -										
29	- 7 6 5 4 3 2 1 — 1 2 *3* 4 5 6 7 -	7-9-03	"	brown	. . .	. . .	. .	*b*	*c*	. .	. .
H.	— - - - - 4 3 2 1 — 1 2 3 4 5 - - -										
30	- 7 6 5 *4 3* 2 1 — 1 2 *3 4 5* 6 7 8	6-19-03	"	"	. . .	. . .	. .	*d*	*d*	. .	. .
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31	8 7 6 - - 3 2 1 — 1 2 - - - - 7 -	. . . . .	"	"	*b*	. . .	. .	*d*	*a*	. .	. .
C.	*b* - - - - 4 3 2 1 — 1 2 3 4 5 - - -										
32	- - - *5 4 3 2 1* — *1 2 3 4* 5 - - -	. . . . .	"	"	*c*	. . .	. .	*a*	*a*	. .	. .
S.	— - - - - - 3 2 1 — 1 2 3 - - - - -										

* Before prosthesis. † After prosthesis. ‡ After prosthesis the body weight increased nine pounds.

and the starch granules are therefore inaccessible to the iodin.

The feces must then be boiled with potassium hydrate in a dish, or, as a makeshift, drawn through a flame on the slide; then they must be neutralized by a few drops of glacial acetic acid, when the Lugol solution appears. The boiling in presence of the potassium hydrate dissolves the cellulose, and the result is a beautifully blue color of the starch granules.

[*See* TABLE—*pages 1275–79.*]

Five degrees of the amount of undigested starch are distinguished, as follows:

a = excessive.
b = plenty.
c = clearly present.
d = traces.
e = absent.

[This lettering has also been adopted in the tables to indicate the relative amount found in the case of each of the substances tabulated.]

GROUP I. *Feces of persons with a sufficient number of teeth.* [Nos. 1–37.]

We call the number of teeth "sufficient" if at least four couples of molars or bicuspids are present. We distinguish, of course, between "bolters" and "masticators."

These examinations prove clearly that every bolter shows starch in the feces, in spite of a sufficient number of teeth, while masticators, on the contrary, with a sufficient number of teeth, seldom show starch in the feces. Furthermore, we find in the feces of bolters unchanged or reduced food which can generally be seen with the naked eye, such as residues of vegetables, berries, pieces of fruit, especially raw, also a great many fruit stones and pips, with other matter.

GROUP II. *Feces of persons with an insufficient number of teeth.* [Nos. 38–52.]

If the patient has less than four couples of molars or bicuspids, the feces contain more undigested starch in inverse ratio to the number of molars or bicuspids present (only the two cases Nos. 47 and 52 are exceptions). If these patients had been bolters, and not masticators, the records would be of even greater importance.

GROUP III. *Feces of persons* (A) *before and* (B) *after prosthetic treatment.*

I group the patients with insufficient number of teeth together (A) so as to show the important contents in starch. I next show (B) the results of the analysis of the same patients' feces after the use of artificial teeth, viz, after they had become accustomed to these (within from three days to six weeks). From these findings you will see that the starch has disappeared from the feces. The *italic* figures indicate the artificial teeth.

You will note that in group III not as many muscle fibers were noted as in group II, in which on an average more molars are present. It may be that these people cut their meats in very fine pieces, and therefore we do not find larger fibers in the feces.

It may further be noted in this group that the lessened number of teeth has developed "bolters." These people are obliged to swallow their food without masticating, and are called "bolters from necessity." I remember particularly, that the artificial dentures included molars with four cusps in good occlusion.

GROUP IV. *Feces of persons with ample prosthesis, yet meager digestion of starch.*

These patients, in spite of full artificial dentures, lose a remarkable quantity of starch; but, on careful interview, the patients stated respectively that they had either taken out the dentures during meals, or that previous to wearing artificial dentures they had been accustomed to eat paps, or that they were still bolters in spite of their full dentures.

GROUP V. *Feces of persons* (A) *with and* (B) *without artificial dentures, showing effect on starch.*

The five cases of group V show most conclusively that the teeth are absolutely necessary for the digestion of food. Often the well-fitting artificial teeth had been used for many years. There has been no loss of starch. When the dentures were taken out the starch immediately reappeared in the feces, and it again disappeared as soon as the teeth were reinserted.

Some patients told me that, since the loss of starch had ceased, their body weight had increased. I want especially to call attention to the fact that insalivation is no less important than mastication. I have been able to prove that some patients who had artificial dentures sufficient for mastication, nevertheless showed starch in their feces, and a new plate, and a raising of the molars and bicuspids was required to make the starch decrease. The increased function of the masticating muscles and the stronger compression of the parotid glands reduces the amount of starch in the feces. (I wish to call attention again to the instance of the cat, in masticating paps.)

The carbohydrates on an average constitute three parts of our whole nourishment; insufficient use of starch, therefore, means an important loss of nourishment. The first

indication for the dentist, therefore, is conservative treatment of the molars; if this be impossible, it is absolutely necessary to insert artificial molars in order that mastication may be resumed.

The public especially must be familiarized with this matter, because a great deal of the nourishment of the average population consists of vegetables, because vegetables are not so expensive as meats. The filling of molars is a necessary charity work which will prove to be a saving in the long run.

The results of these investigations furnish very valuable material of proof to careless patients, who desire that the dentist only treat and renew their visible anterior teeth, and who think that the bicuspids and molars are of no importance.

SUPPLEMENTARY SERIES.

Finally, as a supplement, the research work of my pupil Dr. Niederer is recorded. He has made investigations under the guidance of two specialists in fecal examination, Dr. Oefele and Dr. Kaeppel, and his results are the same as my own.

The conclusion of your Correspondent is that the scientific findings of Prof. Michel, Dr. Von Oefele, Dr. Christ, and Dr. Pullman, present to us a work the full realization of the importance of which would place the dental profession in a more dignified position in the world of the healing art.

We know by clinical experience the benefits derived from the re-establishment of normal occlusion of the teeth or from restoration with prosthetic pieces. But the value of the physiological functioning has not been proved macroscopically before, and we may, in the light of these investigations, rightly suggest to physiologists that they review their chapter on pancreatic secretion, in order that they may not mislead our medical and dental students.

This being accomplished, the physiological value of the organ of mastication in the process of digestion may eventually attract the attention of the scientific world to a full realization of its value in normal functioning.

We owe these investigators a lasting debt of gratitude for their scientific work.

Respectfully submitted,

H. C. FERRIS, *Correspondent.*

Dr. FERRIS. We can cure cases of lesions in the kidneys and the liver by establishing mastication in the molars and bicuspids. Mr. Fletcher has proved from a clinical standpoint just what this man has proved from a scientific standpoint. I do not believe it can be disputed. He has examined at least 150 specimens of feces with this careful technique.

He finds that the feces of an edentulous patient contain a large amount of starch. He introduces a denture, and the starch disappears; after removal of the denture the starch reappears in the feces! We have never had such proof presented to us, and it is a wonder that this report has ever lain idle in the German literature.

In conclusion I want to say that I believe this report could not have been better translated for the dentists of the United States than by Dr. Von Oefele, who has recently come to New York city. He has analyzed 2000 feces, and he stands pre-eminent as a specialist in feces examination. His technique is accepted by all the French, German, and English authorities as the proper one for quantitative analyses.

This report constitutes a most valuable treatise for the benefit of the profession and for the strengthening of our position in the examination of salivary secretions. It can no longer be said now by any physician that the condition of the mouth and the absence of teeth have nothing to do with the development or nourishment of an individual. It can no longer be maintained that an individual can live just as well and with the same amount of vitality without insalivation of his food—that the pancreatic secretion will take care of it. It is evident from this examination that insalivation must take place before we can have a normal digestion and realize full food value.

The report was received and ordered printed.

The next item on the program was a paper entitled "The Conditions of Success," by Dr. J. LEON WILLIAMS, London, Eng., which in the author's ab-

sence was read by the secretary, Dr. Hillyer.

Dr. Hillyer. It was Dr. Williams' full intention to be present at this meeting, but circumstances arose that made it impossible for him to reach this side of the water in time for this meeting. That is the only excuse for its being presented by proxy, when we would so much rather have had Dr. Williams read it himself.

[Dr. Hillyer then read Dr. Williams' paper, which is printed in full at page 1200 of the present issue of the Cosmos.]

Discussion.

Dr. S. G. Perry, New York. Dr. Williams' paper stands on a high plane. It is the output of a thoughtful, mature mind. It could not have been written by a very young person.

A man must have the habit of deep thought to comprehend many of its terse sentences. It is compact, logical, sane. In a certain way it is contemplative in its attitude toward this hurly-burly that we call life.

His point of view is that of a man who has passed through the heave and strain of life, and has reached that high level from which it is possible to see in proper perspective the things that are real and lasting in human life.

Before presenting my own view of the essentials of success in professional life, I will comment on some of Dr. Williams' sentences. In speaking of man's possibilities he says, "By processes of material and spiritual evolution man is becoming more and more the master of nature and himself."

This is a profound sentence and full of meaning to one who believes that the material and spiritual are bound together in man's nature. It is impossible to contemplate the marvelous discoveries that have been made in the realm of physical science, and to note the control that man has over the imponderable forces of nature without believing in the spiritual forces that lie back of all. Matthew Arnold called this spiritual something, "sweetness and light." Converted into plainer English this means honesty, unselfishness—in fact, all of the cardinal virtues. If this be granted, then success in life means a sane mingling of the material and spiritual; in other words, it means—make money, which is material, but make it honestly, which is to make it spiritually.

Another sentence in the paper has peculiar force. He says, "Ethics is usually interpreted as a term of restraint, when it should mean liberty of the highest order." This is true. To live ethically is to be absolutely free. It is to be on easy terms with all fine things in the universe. It is to be social with God. It is to be free to commune with the divine in the silence of the night—and also free to smoke and drink with the boys without surrendering the same high consciousness, when you are out for a lark! To live unethically is to be intimate with the devil!

Farther on Dr. Williams says that a man is successful just to the extent that he can convert his powers and accomplishments into something that will add to the comfort and happiness of his fellows. In my opinion this is one of the most forceful sentences in the paper. It furnishes the highest justification to any young man who contemplates entering our profession. If this young man wants money, he can do better elsewhere. If he wants to be useful in the world and comforting and helpful to his kind, he will find in our profession a broad field where he will so take on the habit of work and the habit of helpfulness that when he is old and ought to retire he will not do so, because he cannot abandon his patients any more than he can abandon his wife and children. He will be willing to have a pain in his back for the sake of his patient's comfort. This sense of helpfulness takes away the sting of hard labor, and furnishes an inspiration that makes it possible to live. It softens the hard places in life, and gives courage to go on to the end. It is also the cornerstone of permanent professional success. It is bread cast upon the waters that will come back more than a thousandfold. It may make life a burden, but life is not

appreciated if it is not a burden. Living to play is only to play at living. Living to work is to live while working. To think of others is to forget one's self, and self-forgetfulness is necessary in the doing of any great work. Our professional work may not be classed as great work, but it must be considered as very necessary work.

Man's religious nature calls for the ministration and expert services of his clergyman. The expense of his religion must be considered the same as the expense of his food and clothes. His infirmities call for the services of his physician and surgeon. His pride and his comfort call for the attention of his dentist.

Very many are good enough, or bad enough, to neglect or ignore the clergyman; many are well enough to not need the doctor or the surgeon, but few are fortunate enough to escape the dentist. In these days when the teeth are better cared for, the need of him is almost universal.

His work, then, becomes important, and is of a kind that will call for the very highest quality of hand and heart. If he thus ministers to the comfort of humanity, his life-work will be a success. If he dies poor, his life will yet have been rich. He will have been the modern Good Samaritan.

Dr. Williams says, "To believe greatly is to will greatly, and to believe and will greatly is to achieve greatly." This is a sentence worthy of Marcus Aurelius. It is what the religionists would call "getting religion." It implies being converted to a belief in a high mission. It means inspiration, and inspiration is the opposite to stagnation. It reminds me of a copy that as a youngster I used to write in the copy-book—"To dare and do on the great battlefield of manly adventure!"

Dr. Williams wisely advises the young "to undertake no useless or worthless action, and to always do in the best possible manner whatever we undertake."

The keenest regret that can come to any earnest man is the regret of wasted time. There are few men whose lives are not more or less marked by the wrecks of misapplied effort or of actual loss or waste of time. There are only so many seconds in the life of even the oldest man, and as from one-quarter to one-third of them must be blotted out in sleep, there are not too many left in which to do great things in the world. If it is not given to all to do the truly great things, it is given to all to do the moderate and helpful and good things, and the seconds are too precious to throw away. This may sound like an exhortation to the young—it is intended as a hint to the old as well! To keep busy is one of the essentials of success.

Another important point in the paper is well made, namely, that there should be a conservation of energy in everything a professional man does. There should be no false motions in the use of instruments, and no confusion in their arrangement.

Dr. Williams says, "Success is won by becoming masters of ourselves, our tools, and our materials." It is not possible to improve on this sentence.

He further says that a man may be stronger than the whole world, and the joy of it is beyond anything the world has to offer. It is refreshing to hear a scientific man use the word "joy!" It indicates that he has sentiment—that he is human! It gives him away, but I prize it beyond any word in the essayist's paper. It expresses what can be known only to those who have felt the thrill of doing fine things. It is as if God were whispering approval in his inner ear.

In this valuable paper Dr. Williams has not attempted to enumerate the various factors that lead to success in professional life. I cannot resist this opportunity to tabulate some of those that seem to me most important. I will not attempt to name them in the order of their importance, as there might easily be great difference of opinion on that subject. If I were to attempt a classification I should begin with honesty, and with the copy-book that says that "Honesty is the best policy." To be honest is to be sincere, and sincerity is the rock foundation that cannot be swept away by the waves of the

combined forces of the evil of the universe!

If I were to pose as the philosopher and friend of some young man just entering the profession I should say: After honesty, acquire ability of the highest order possible! Tabulating the things to do, I should say: Have your long whiskers cut off and take a bath and shave every morning! Brush your teeth twice a day, with Calox in the morning and Kolynos at night. If you must use your own powder, use it after luncheon. If you have pyorrhea, have it treated by some expert, or—go to farming.

Have your finger nails manicured twice a week. Smoke one cigar only after dinner on week-days, one after each meal on Sundays and as many as your nerves will stand when you go a-fishing. Chew tobacco only when crossing the Desert of Sahara alone. Take a drink in your imagination, then you will not need a clove. Have your hair cut short once in two weeks. It will then not tickle the cheeks of your lady patients and make them nervous when you bend over to work on the left side of the mouth. Keep your patient's mouth open and your own shut. It may not be worth ten dollars an hour to hear you talk. If it is, the patient may not think so. Make hay while the sun shines, because the light is good. Make love, if you have to, when the moon shines, because the light is bad. Keep your fingers and your soul clean, whether you dress in black or white. Keep your linen clean, even if your shoes go unpolished. Keep your instruments clean and sharp, and when you cut, cut! Not rapidly, but steadily, and with a firm hand and a tender heart. Be sweet-tempered, and smile like an angel, and some day you may be one. Some philosopher has said that it is possible in time to grow to be what one would like to be. If you lose your temper, you may lose your patient.

Acquire a knowledge of the classics, of the great literature of the world, of art, of music, of gardening, horticulture, farming, fishing, sailing, and you will be equipped for the company of the elect.

Each new language you acquire introduces you into a new world and broadens your horizon and makes you a cosmopolitan in the truest sense. Someone has said that to know three languages is to be equal to three men. A cavity prepared with the good sense of the English, filled with the solidity of the German, and finished with the exquisite art of the French speaks for itself!

Having named some of the things that I think should be done to insure success, let me mention some that should not be done.

Don't brag about what you know. If you let your patient know what you know, he will know as much as you know, and he may become as much "stuck-up" with knowledge as you are.

If you have the "big-head," don't tell of it. If you have it and can keep it a secret it will be all right, because it makes you feel good. The chances are, however, that the secret will leak out!

Don't "putter!" Hit the nail on the head. Life is short, and every moment counts. Work is the emblem of the age, and every stroke should tell.

Don't split theological, philosophical, or scientific hairs with your patient. You may get careless, and split the root. While exposing the fallacy of your victim's argument you may get excited and expose the pulp. Besides, you may expose your own ignorance. Be a mummy, and keep "mum" during office hours.

Don't wear a long face. It deepens the gloom. Life is not a funeral, though it ends in one. Cheer up, because the worst may be coming.

Don't tell about how many cases of pyorrhea you have treated and cured. The patients may let the cat out and say that you maltreated them, and they endured, and they are not yet cured!

A celebrated man of letters on the downward side of life, in speaking of his health, once said to me that he had observed that he got better, but he never got well!

Don't put on the dam and prop the mouth open and talk about Taft to a man who voted for Bryan!

If you are English and trade gold crowns with your patient, don't let yours

show in his mouth, while you hide his in your pocket.

Don't be a goose and call Jones a quack! He may retaliate and say there are two quacks!

Don't get angry at Smith, because he kills a pulp when he sees it. Some day you may kill a pulp when you don't see it. Then you will both be murderers, and see ghosts in your old age.

Don't put a Perry separator on a pair of superior centrals and screw till the suture opens! You will put the inventor in a hole, and lead your patient to think him a barbarian!

Don't work too rapidly. If you put a filling in quickly, it may come out slowly!

Don't charge too much. You may have to sue, and then you may get too little.

Don't fail to learn to keep a secret. You will know a great many before you lie down to die. You will be asked, "Can I trust you?" Your answer should be "I trust you can!"

Don't believe that Old Adam is dead! You will find him alive in some of your patients. You will know it when your patient walks off without paying for a bridge of great size you put in for him. It will be a bridge of sighs, when you pay Whites for the gold it took to make it!

Don't be surprised when your patient tells you that Mother lost all of her teeth before she was fifty, that Father had double teeth in front, and Uncle John had a third set when he died!

And finally, don't be discouraged—because, if you are really determined to be a dentist, you will know a lot before you retire from practice. You will get angry—but you will get over it. You will be discouraged—but you will find that hope springs eternal in the human breast!

You will be a barbarian when you are young, but the mellowing effect of time and your gentle ministrations to those who suffer will make you a saint when you are old. You may die poor, but if you have lived up to the constitution and by-laws I have laid down, your old age will be decked with friends and flowers, and your life will have been a success.

Dr. W. W. Walker, New York. After Dr. Williams' masterly exposition and Dr. Perry's remarks, there is very little left for any of us to say on this subject.

This paper seems to have been written for the young men as well as the old. The essayist failed, however, to speak of the duty of the young graduate. Many of us consider that the first duty of a young graduate—of a young man entering the profession of dentistry—is to connect himself with some good dental society or organization in the locality in which he resides. This the older men of the community should also do.

In New York city we have one of the many districts of this State Society, and we are trying to impress upon the old men as well as the young men the fact that there is a live district society there. We have increased our membership in the last two years from about 225 to 400 members. There are now about 1900 ethical dentists in the city of New York who are not members of any dental organization; so you can see how much missionary work we still have to do in our city, not only among the young, but also among the older men. We intend to take up this work during the coming winter. Dr. Williams lost sight of that phase in the dentist's career, and also Dr. Perry forgot in his advice to the young men to mention the benefits to be derived from membership in the district society.

The acquisition of many friends and popularity are of course important factors to a young man starting in life; but above all else, the "golden rule" must be strictly adhered to, from the start to the finish—To do unto others as you wish to have them do unto you. That is a principle for the younger members to remember; perhaps some of the older members could take a hint from it too.

Michelangelo was right when he wrote to his friend the cardinal that he could not depend upon the promises or the assistance of others, but must rely upon himself. Occasionally we can rely on a dear friend for assistance; but in the end self-reliance is the one great mainstay, and adds much to a man's professional character. To act always with

courage and sincerity will insure the best and truest success, and when we have finished here, we shall probably, in the language of our old friend, "sit up and take notice."

President Nash. We would be glad to hear from Dr. Gaylord of New Haven, Conn., on this subject.

Dr. E. S. Gaylord, New Haven, Conn. I certainly appreciate your courtesy, but I am absolutely unprepared to speak as I would like to in regard to this paper. It is an admirable, beautiful, sweet product from one of the sweetest men I know. I am delighted to have had the privilege of hearing it. I do not feel, however, that I can discuss it now.

Dr. William Jarvie, Brooklyn, N. Y. Dr. Williams' paper is one of the most beautiful expositions to which I have ever listened, upon the lines that one must follow if one expects success in this life; moreover, it was so ably followed up by Dr. Perry that I feel that any attempt to add anything to either would perhaps spoil both; so if you will excuse me, I will not say anything further upon this subject.

The next item on the program was the paper entitled "Sectional Inlays," by Dr. S. G. Perry, New York, N. Y.

Dr. Perry. I do not expect approval of this paper. I expect to be misunderstood, and I shall be quoted as believing in sectional inlays very generally. The fact is that I believe in their use to a limited extent only, but I am going to trust to time. Before I die I shall see them justified, I hope.

[Dr. Perry then read his paper, which is printed in full at page 1204 of the present issue of the Cosmos.]

Discussion.

Dr. Perry. I should like to show now the gold filling which I inserted in the mouth of my cousin thirty-eight years ago, when I was practicing in Yonkers. I am showing this not with the intention of bragging about it, but in order to emphasize one point—that is, that gold fillings, when carefully and thoroughly made, if they are large and cover the whole of the approximal surface, will in the majority of cases stay in almost indefinitely; also in order to hold our profession in check against hasty and careless cutting of the human teeth for the sake of inserting big inlays.

Here are two poorly prepared examples of a gold inlay put against a thin wall, the rest being filled with amalgam, and two bicuspids with gold on the buccal and amalgam on the inner surface to hold them in, so that the outside will not be discolored.

Gentlemen, I do not for a moment expect that you will have the faith in this practice that I *must* have because I have to believe in the evidence of my own eyes and my own common sense. Do me this justice—to believe that I do not advocate these sectional fillings too generally, but more particularly in those very special cases where you want to do the best you can without cutting the teeth too severely.

Dr. William Jarvie, Brooklyn, N. Y. This paper is most timely, and the Dental Society of the State of New York is fortunate in having this subject presented by Dr. S. G. Perry, who is so well fitted to do it. He is one of the most able practitioners of dentistry; he has no superior as a conservator of the teeth, and fortunate indeed is the person whose mouth is under his care! He not only speaks with authority, but always with so much grace of diction and literary perfection that it never fails to be a pleasure to listen to a paper presented by him. And the paper we have just heard is no exception to this general rule.

The use of inlays has revolutionized the art of saving and restoring badly carious teeth to beauty and usefulness. It has not only made the life of the dentist less burdensome, removing much of the physical and nervous strain incident to prolonged and delicate operations upon teeth in which much substance had been lost either by caries or fracture, but it has also freed our patients from operations from which they shrank on account of the long-continued strain and suffering to which they were formerly

subject, but which have now been rendered brief and comfortable for them. By the use of inlays the crowns of natural teeth are restored to usefulness and beauty which formerly were sadly disfigured or replaced by artificial ones.

Knowing as well as I do Dr. Perry's strong desire to preserve the natural teeth and with no more loss of tooth substance than is necessary for securing such a result, I can well understand how his feelings have been frequently lacerated by witnessing what would seem to him the ruthless sacrifice of tooth substance as part of the operation of inserting inlays. So it is quite natural that, having devised this plan of restoring badly decayed teeth with comparatively little loss of tooth substance, he should not only make it known through the medium of a paper to be read before this society, but should earnestly urge its adoption by members of the profession, so that the community at large might receive whatever benefit should result by its practice.

Those who know Dr. Perry are aware that there is no more expert saver of teeth and conservator of tooth substance practicing dentistry today. Neither is there anyone more ready than he to adopt new and approved devices to assist him to that end. Do not think for one minute that he did not hail with delight the advent of the inlay, both of porcelain and of gold, or that he does not restore the contour and completely fill many large cavities with a single inlay. In such work he is an expert who is excelled by few in the perfection and beauty of his operations.

The operation which he has just described to us is adapted, as he has told us, to that large class of teeth, principally the bicuspids and molars, having very large cavities, which, if completely opened up to admit an inlay big enough to occupy the entire space, would require the cutting away of so much sound tooth structure as would seem wicked and would not only disfigure the tooth, but tend to weaken it vitally.

I need not repeat the process; it is described so fully and so clearly in the paper, and you have undoubtedly given the reading of it such close attention that any repetition is unnecessary. If the filling material other than the inlay is mostly out of sight, I should prefer amalgam. It would combine with the gold inlay where it came in contact with it and make a perfect joint, or rather union. Being plastic it can readily be thoroughly adapted to the cavity, and, after hardening, the surface can be polished as highly as that of the finer metal.

Parenthetically I would like to emphasize what the essayist has said regarding amalgam. It is the most abused material employed in dentistry. I once had occasion to write of it to an association of physicians who were agitating a crusade against its ever being used in the mouth, as follows: "That it was the abuse of amalgam that was harmful and not its proper use. That the most potent poisons were the most valuable remedial agents, and that physicians would not forego the employment of arsenic, belladonna, nitro-glycerin, chloroform, and other poisons, because their careless or improper use would prove fatal." So it is with amalgam. Use a good alloy (the essayist prefers Standard), mix it in proper proportions, adapt it perfectly to the walls of the cavity, condense it thoroughly, polish the surface to a fine finish, and the result will generally be very satisfactory! A result very different from that would be if you selected the alloy on account of its low price, mixed it to a consistence to be decided by its ease of introduction into the cavity, and finished by the rub of a burnisher, or mayhap by a wipe of a finger.

The era of cast gold inlays was just commencing about the time when I retired from practice, but I retain a lively interest in all that is going on in the profession and keep in touch with all its advances. I sincerely regret that someone had not discovered this process much earlier, that my patients might have been relieved from many long and very tedious operations which they were obliged to submit to during the filling with gold of large and difficult cavities in the posterior teeth, and also that I might not have had to undergo the fatigue incident to

such operations. Sometimes I envy the men who are practicing today with possibility to accomplish results which were not practical five years ago. Porcelain inlays I employed for several years, but cast gold inlays have been introduced since my retirement. As I see from time to time the beneficent and beautiful results of this class of work, I do not wonder that dentists become enthusiastic over it, and sometimes in their enthusiasm undertake operations that the conditions hardly warrant and which result in failure. This is not so likely to occur with operators of long experience and great ability. But I fear for the younger men in our profession, men with great ambition but only short experience. As the essayist has pointed out, the stress upon the teeth during mastication is great, greater than can be borne in the case of many teeth that have been ruthlessly cut away to admit of large inlays, and failure is likely to follow such operations.

The essayist has done a special service to these younger men in sounding a warning of the danger and likelihood of failure because of extensive cutting away of sound tooth structure, so as to admit of large inlays. He has not left them guessing, however, for he has done them a much greater service in describing a method by which very much of this cutting away may be avoided, the teeth left strong, and the inlay securely retained.

Many failures in gold and porcelain inlay work will happen in this class of operations when performed in the so-called "dental parlors." "Cast gold inlays" sounds well and can be made to appear as an operation most desirable to the patient, and also—though this is not mentioned in the advertisement—will be most remunerative to the proprietor of the "parlor." Operations of this character in such places are most likely to be imperfectly performed and to result in failure. Although unjustly so, more or less odium will fall upon cast gold inlays rather than the blame of failure be laid upon the imperfect manner in which the operation was performed. The greater, then, is the necessity that reputable practitioners use the utmost care and exercise the wisest judgment in the method of performing inlay operations, so that the line may be the more distinctly drawn in the public mind between the value of operations performed in the so-called "parlors" and those performed in the office of the reputable, judicious, and conscientious dentist.

Having had many years' experience as an operator, the manner of employing inlays as described by Dr. Perry appeals to me very strongly as most valuable and efficient. I believe that if it were adopted by every dentist as one of his methods of applying porcelain and gold inlays, much valuable tooth structure would be retained that is now cut away, and the class of teeth referred to in the paper would be left both stronger and more sightly.

Dr. H. W. Gillett, New York. To be asked by the president of a state society to discuss one of the leading papers is a mark of distinction; to be asked to discuss a paper of Dr. Perry's is to draw the mark in red.

It is always difficult to discuss his papers, for several reasons: first, he is apt to exhaust his subject; second, he treats it in such a manner as to leave but little chance for exception to be taken to his statements, and none whatever for improvement on his phrasing of the principles advocated; third, we of New York all hold him in such regard and esteem that we find it difficult to voice any disagreement.

I want to call attention to the first paragraph of Dr. Perry's paper, as a piece of word-painting: "To be confronted with the filling of a large cavity in a tooth in the human mouth is to be confronted with a problem that is always interesting and sometimes very difficult. To meet such a condition intelligently is one of the great objects of dental education, and a problem which has taxed the ingenuity of the best operators from the earliest days to the present time"—a broad introduction to a most interesting subject!

One of the first items I want to speak of is amalgam, that white angel, pos-

sibly, that some of us have been overlooking.

I have the feeling that we are going to swing round the circle, as Dr. Perry has hinted, and after a few years shall be giving amalgam more recognition than during the last five or six years. In thus saying I wish to guard against any misunderstanding on your part, as that I am advocating a general use of amalgam in contradistinction to the use of inlays. I am using inlays very constantly, and sometimes, as I look over the day's work, I wonder whether I am over-using them, whether in some instances an amalgam filling properly placed and finished in the manner that I have heard Dr. Perry describe would not have done quite as much justice to my patients, and perhaps would have been much easier for them.

On the other hand, the misuse of amalgam is appalling. The unutterable sloppiness of a large percentage of the amalgam work that we see coming from the hands of men of good standing is a disgrace to our profession.

A point to which Dr. Perry referred, with regard to the zinc oxyphosphate filling and its satisfactory qualities, is one which I wish to emphasize in this discussion. In conversing with patients, who inquire sometimes concerning the gold inlay, to whom the gold inlay is a new idea, and who raise the question, "Is it a good filling? Will the cement last?" I phrase my reply something like this: That we have no better filling for a carious tooth than oxyphosphate, provided it can be protected from the fluids of the mouth; and that, instead of looking at the gold inlay as a filling that is cemented in, they should look at it from the other viewpoint—they should regard the tooth as being filled with cement, covered with a tight stopper; that the gold inlay is merely the stopper to protect that filling, and that the cement filling will be durable and satisfactory just in proportion as the stopper is made tight and perfect at its margins.

Dr. Perry remarked concerning the gold inlay that unfortunately it can come out as well as go in. That is a question of mechanics. Any man who is capable of realizing the advantages of gold inlay work to the point of making use of it in his practice, offering his services to his patients for preserving their teeth by means of such inlays, should thoroughly realize that he must fit himself for the manipulation of inlays along the lines of approved mechanics. If an inlay is properly anchored, I personally have no feeling of apprehension concerning its coming out. I do not feel that an inlay has been properly made and inserted if the cavity and the inlay have been so shaped that when in place without cement it can be removed in any other than in the one direction—that direction to be the one exposed to the least stress.

There is evidence, in the mouths of patients whom some of us see, of the need for attention to that point of mechanics on the part of some of those who are using the gold or other inlay. There is evidence of the need for postgraduate instruction, of more earnestness on the part of the men in practice to learn the detail of the technique of such work before attempting it, of a great deal more earnestness in their determination to do their work with thoroughness and in the spirit so happily described in the paper by Dr. Williams presented this morning, which, I wish to say parenthetically, I regard as a classic on its subject.

If Dr. Perry were to see any large number of my patients—or perhaps he would not need to see a large number—I am inclined to think that he would class me with those to whom he refers in his paper as operators who are cruelly cutting away teeth and whom he indicts for cruelty, and perhaps also for carelessness. I imagine that when he says cruel and careless he also means ruthless, which is the word which Dr. Jarvie has used. Here the factor of personal equation enters. In many of these discussions my mind travels back to Dr. Perry's classic paper on that subject of the personal equation, and our disagreements in our professional discussions. So many discussions grow out of the differing viewpoints and the differing personalities!

Having acknowledged that I have a suspicion that Dr. Perry on examining my work might class me among the cruel operators, I want to take exception to being classed amongst those who pursue any such practice thoughtlessly. I want to suggest that there is another viewpoint concerning the question of cutting, and I would say most emphatically that in my own case that cutting is not done thoughtlessly.

Let me refer for a moment to an occurrence in Philadelphia ten or twelve years ago, when the American Medical Association met there, and I attended the meeting of our section. At that meeting our lamented friend Bonwill asked that a committee be appointed to come to his office the next day, and inspect his work in the mouths of a number of patients whom he would present. That invitation was given as late as four o'clock in the afternoon, and it was nearly five when Dr. Bonwill's secretary started to request his patients to appear at his office the next morning.

I was not a member of the committee, but took advantage of the general invitation to be present. I have never seen anything more impressive than the way the patients appeared in Dr. Bonwill's office. When the committee, accompanied by myself, arrived, the reception room was filled with patients. That was between 8.30 and 9 o'clock. When we left at 1 o'clock, the reception room was still full of children, matrons on their way to market, business men, and professional men, many of whom made the remark, "Well, the next time you want me, I wish you would let me know before the morning mail." Yet these people, who received the notice at the breakfast table, dropped everything else to go to Dr. Bonwill, because he had asked them to come. The point is aside from the question, but it leads up to what I wish to refer to, namely, the astonishing exhibition in the use of amalgam. All of you who have been in practice long enough to have come within Dr. Bonwill's influence know his position in that matter. I thought I had understood Dr. Bonwill, but the exhibit of the possibilities of the use of amalgam that was put before us that morning was a revelation to me; and I speak of it today for two reasons—first, in order to refer again to the value of amalgam, and second, to return to this question of broad cutting. There was presented case after case in which cutting had been more extensive than anything I have ever seen in inlay work, or anything I have ever supposed was advocated by anyone—more extensive than I supposed Dr. Bonwill advocated; and yet those patients, when questioned by the committee as to how long the work had been in their mouths, would say ten, fifteen, twenty, or thirty years—and I think some of them forty years. Some of them had been Dr. Bonwill's patients in his very early years, and they told us those enormous amalgam fillings had been inserted in those years and had remained undisturbed. It was a noteworthy exhibit of what can be done by thorough, conscientious, careful work.

Coming back to *the viewpoint* in the cutting away or the saving of frail corners and margins—or, to make the question broader, of the ultimate saving of weakened and frail teeth, and approaching this subject from the opposite viewpoint—not for the sake of disagreeing with Dr. Perry, because I admit the value of all his statements, confessing freely that I need just such a paper every little while, that I may read it and weigh its point of view, and escape the possibility of doing reckless and thoughtless cutting—let us consider the question not of saving a frail corner or the side of a tooth for the sake of keeping it in the mouth, but the restoration of that frail and weakened tooth to usefulness, the preservation of an efficient masticating organ as a whole—getting away from the question of a good filling in the individual tooth, and back to the question of the relation of that tooth to the whole masticating organ.

We must consider the question of a solid foundation for our work—the question of whether it is wise to follow a procedure that may preserve the tooth for a short period, or one that we feel reason-

ably sure will preserve it against breakage for a long period; whether it is wiser and better to cut away that kind of corner that Dr. Perry has in mind, and which he has shown us in the samples, or whether it is better to build under it and leave it exposed to the possibility of breakage. Here the personal equation enters, and I confess that I myself am sometimes at a loss for a decision in my own practice, but my leaning is toward the radical piece of work, while I do not fail to recognize that it is not proper to cut away a probably serviceable wall or corner. Being constituted as I am, however, it is difficult for me to leave in an important tooth a portion that is exposed to the possibility of breakage, and in a case where I have done radical cutting, and have then adopted the necessary precautions to anchor the subsequent inlay or filling, I have less fear of breakage and loss of that tooth than if I had left some questionable material standing.

I recognize that I am liable to the same misunderstanding as Dr. Perry has referred to. There is the possibility of a misunderstanding on the part of the young men who read these reports, which might lead them to the ruthless cutting that Dr. Perry has spoken of. On the other hand, there is the possibility of a misunderstanding of what Dr. Perry has said that might lead the men to leave conditions in the mouth that they ought not to leave, as they might produce discredit and failure.

I have been pleased to note in the past year or two, in the discussions of the particular class of subject that we have on hand this morning, the disappearance of the man who, advocating as Dr. Perry has so ably done, the preservation of every possible portion of the individual tooth, yet the next day, or perhaps discussing the next paper coming before the convention, acknowledges that he believes in the extraction of first molars for orthodontic purposes. I refer to that in passing, because it is interesting.

I want to agree with Dr. Perry in regard to some of his later paragraphs referring to careful, thorough, conscientious work. I know of nothing more disheartening than to have a patient come to me from some operator in a distant city, whom I have perhaps known and liked personally, but whose work I have not seen before, and to find his patient's mouth full of work that I can only characterize as sloppy, with amalgam and oxyphosphate fillings put in with no regard to preservation of approximal contact or healthful conditions of gums and pericemental tissue, with inlays with projecting margins, with crowns with bands projecting under the gums. That to me is disheartening, and I want to emphasize Dr. Perry's word of warning concerning inlay work without approximal contact points, with projecting cervical margins and with a cement line that can be measured in hundredths of an inch all around. Those inlays are failures from the day when they were put in, and a disgrace to our profession.

The last word has not yet been said concerning the gold foil filling, the amalgam filling, or any of our materials. I was immensely pleased this week by Dr. Gies' statement made before one of our New York city societies, in his discussion on salivary analysis, that all professional science must always be in a transitional state. He made the statement that no problem in scientific investigation is to be regarded as a closed book. Our field is broadening, and our knowledge increasing, and in the next decade we shall have definite knowledge in fields where we are now groping. I believe with Dr. Perry that there is a place for the foil and for the amalgam filling, and in spite of being an earnest advocate of the gold inlay, I have not reached and never expect to reach the point where I shall lay aside my foil pluggers, or any of the tried and good instruments or methods. I hope to keep my mind broad enough to follow Dr. Perry's advice to hold fast to that which is good.

Dr. R. H. Hofheinz, Rochester, N. Y. I have listened with a great deal of enjoyment, as we all do whenever Dr. Perry reads a paper. In regard to what he said on the conservatism of dentistry there can be no question—all of us must agree with him.

I disagree in regard to some of the sectional inlays, providing the specimens that the essayist has shown truly represent the cavities in the teeth for which he makes sectional inlays. A great many of these cases when shown on models look entirely different to what they do in the mouth, and I believe a number of those cavities, particularly in the bicuspids, that Dr. Perry showed are not the cavities for which he makes sectional inlays in the mouth. I think they must be decidedly different in their character, and must be more like the molar cavity he showed. I disagree with him when he says that in such instances it would be barbarous—or call it anything you like—to sacrifice one millimeter more tooth tissue at the approximal part of the cavity and at the cervical border. I do not believe that in these cases there is much more cutting needed than about one-half of a millimeter, if the models are correct. Regarding larger cavities, I gladly agree with Dr. Perry, although I make sectional inlays somewhat differently.

The doctor says: "I am so impressed with the inlay system that I put in many where the cavities are small and I can open them on the grinding surface, and so dovetail them that the inlays cannot come out."

In my own practice, the amount of inlay is in ratio with the increase in the size of the cavity, and if an inlay is at all in place and at all superior to anything else in operative dentistry, it is in the unusually large cavities, instead of the medium or smaller ones.

There are approximal cavities in bicuspids and molars which are so abnormally large at the cervix, and so abnormally small at the occlusal opening, that in those instances sectional inlays are justified, excepting one resorts to the sacrifice of enamel to a degree which under certain circumstances might be called barbarous. Take a molar where there has been almost exclusively approximal caries, extending at the cervix from five to six millimeters bucco-lingually, but occlusally, however, not over one or two millimeters. The cavity when properly opened, would present approximo-occlusally probably three millimeters in its bucco-lingual extension. In such an instance it becomes a question whether we are justified in cutting away that entire amount of enamel to make parallel walls.

In many of these extreme cases, when I started my inlay career, I filled the cervical part with gold and finished with an inlay, leaving the opening from the occlusal part as reasonably small as possible. I have changed my method. Instead of making the sectional inlay, as Dr. Perry advocates, and which may have a great many superior points, I simply use a quick-setting cement, and fill both the lingual and buccal extension, so as to get the proper parallelism of the wall. After the inlay is completed I have one or two small cement fillings, buccal or lingual, or both, which can easily be filled with gold, amalgam, or porcelain, according to the demand. That has recommended itself to me as the quickest method of making sectional inlays.

In making the sectional inlay as Dr. Perry described, he has to have two very favorable conditions if the cases are extreme. He either has to have sufficient buccal caries to get his first section in buccally, or sufficient separation to allow the first inlay to go to place from the approximal side and to be properly seated against the cervical wall. Those two conditions must exist if sectional inlays like those are made—unless he fills his first part with amalgam or gold; then, of course, it would not be an inlay.

I have never had much veneration for using a gold inlay as a veneer, excepting in such cases as I showed at clinics some years ago. Such gold inlay veneers have only been reliable either upon buccal or lingual surfaces or approximal surfaces where there is no occlusion. In all other cases, I believe in the solid inlay only.

It was one of the greatest pleasures to have Dr. Perry tell us that he read a paper on extension for prevention in 1877. I am sorry that he did not read it to the society at this time. I perused it, and I know you would all be glad to

hear it. It shows that originality is a very questionable thing, and that almost all innovations have been done before by someone else.

I admire the courage with which he, also Dr. Jarvie and Dr. Gillett, advocated amalgam. It takes a strong man to talk about amalgam in dental meetings nowadays, when the young men of today tell us that amalgam fillings are things of the past—especially men who never learned how to manipulate amalgam.

Dr. Johnson read a paper in Chicago in which he spoke feelingly of amalgam. He made the statement that it always seemed to him that an amalgam filling did not call forth the best skill in a dental operator. That is so, to a degree; it may not reveal all the artistic and esthetic ability that a dentist may have. Whenever I have seen a well-placed and well-finished amalgam filling, however, I have always taken it for granted that such an operator understands how to save teeth, and is a good dental philosopher, although I have never been an amalgam man, in the sense in which that term is usually applied.

I pity any operator who has only one method of filling teeth, and much more do I pity his patients. In regard to conservatism in dentistry, I put in a great many sectional inlays to avoid the ruthless and barbarous method of cutting away sound enamel on immune surfaces. It was high time that Dr. Perry gave us such a paper.

Michelangelo has been mentioned in conjunction with the cardinal. When Goethe first visited the Sistine Chapel, and saw the artist's wonderful ceiling paintings, which have never been equaled, he said: "Not even Nature seems good to me now, because I cannot look at it with the same big eyes that Michelangelo did."

I would almost like to say the same in regard to the discussion of Dr. Williams' paper—not many of us can look upon dentistry with such big eyes as Dr. Perry; but it behooves us all to look upon our work with as big eyes as we can bring into use for that particular purpose, and only with such broad vision can we do the right thing at the proper time.

Dr. E. H. Babcock, Brooklyn, N. Y. Thanks to the kindness of Dr. Perry, I had an opportunity of seeing the specimen teeth he brought. I am going to quarrel with him on but one point, and that is the title of his paper. He calls them "sectional" inlays. My understanding is that anything sectional—made up of sections—be it an inlay, or a bookcase, or whatever it may be, is made up of different parts of one thing. Judging from these specimens I should call them "semi-" or partial inlays, because the inlay exists only in part; the rest is a filling. I do not pretend or wish to discuss Dr. Perry's paper. He was in practice long years before I even began to know about these things, and he has contributed as much or more to the knowledge and advancement of dentistry as anyone in the profession. I merely take this opportunity to speak more for conservatism, if I may so style it. I think at the present time too many persons are becoming faddists; this does not apply only to the dental profession, but to the medical and many other professions as well. My advice is, Do not throw away every other material or method because you have inlays! I know of dentists who will insert gold inlays in small morsal cavities. I do not think such work is honest to the patient. I can put in a gold filling that will last longer. I may not charge as much to my patient, but I think the patient will get better service for the money expended.

You will find the same phenomenon in the history of medicine. Sir John Lister, when he started using carbolic acid as an antiseptic during surgical operations, had not only the wound washed, but also the whole room sprayed with it, and operators as well as patients developed nephritis from the effects of its too general use. It was not long before no one would admit using it. The same thing is exemplified in the history of the copper amalgam craze, and in many other instances. I believe we should be eclectic. The primary requisite

is to look at the needs of the patient, consider what is best, and do the best we can, according to our skill and ability. That is my reason for advocating eclecticism and conservatism.

Dr. Hofheinz. I do not think I misunderstood Dr. Perry, that he puts in sectional inlays. Do you put in the first section, and then another section?

Dr. Perry. I thought my paper explained that I make the sectional inlays almost entirely from the cavities up to the masticating surface—not generally from the buccal side. I have, however, repeatedly made the inlay you speak of, and I think it an excellent one under certain conditions, *i.e.* filling the cavity first with zinc oxyphosphate and sandpapering it to a clear outline, then cutting from the grinding surface a parallel shape to the cervical border and setting the gold inlay therein, and next cutting the cement out from the lingual side, and filling, generally with amalgam, occasionally with gold, but often with porcelain inlays on the buccal side to save the color of the tooth. I did not have in mind the opening of the cavity so much for gold inlays from the buccal side, but sometimes the inlay is inserted from the buccal side, introducing it sidewise, when porcelain is used, which restores the color of the tooth in bicuspids.

Dr. H. J. Kauffer, New York. I am delighted to have had the pleasure and privilege of listening to this paper, because it shows concentration of thought along a certain line which has been followed for years. It would be better if we all gave the same consideration to one subject, and followed it from our student days on. We try to cover too large a field. Dentistry is too broad a subject to be covered by any one man in its entirety. Personal study of his abilities is the first requirement of a student who accepts dentistry as his like-work; he must undertake the tasks which he is best fit to master, and apply all efforts in that direction. Striving to grasp the grapes that hang too high is a waste of energy. Do what you can do, and do that well, and you will find that the grapes will come down when you are able to digest them.

Cleaning the teeth was considered as the simplest and most despised work in the dental college, even ten years ago. It invariably was assigned to the first-year men in the dental clinic; but these men after they have become fascinated with this work, and have learned to clean teeth thoroughly, are today the specialists who are curing pyorrhea alveolaris, a disease formerly pronounced incurable. So it is with all our work; if each practitioner would give his entire attention to the branch to which he finds himself best adapted, and would master that subject, he would render the profession at large a most valuable service. In other words, originality is the fundamental principle of progress. Learn to be a pioneer; imitators are plentiful.

Dr. Perry has given the profession his life service, and his paper of today only proves another step forward. He does not grasp an idea today and tell us about it tomorrow; he works for years until he is sure of what he gives to the profession.

Dr. Hofheinz. I would request the Chair to ask Dr. Perry to read the two extracts from the paper he read in 1877, to which he referred.

Dr. Perry (closing the discussion). I have made allusion to that paper this morning, not for the sake of calling it up again, but in order to bring out more clearly the possibility of making the approximal surfaces of gold inlays in a better manner than we have ever been able to make them before with gold, because we can make the gold very thin in the inlays, and lap it over the edge, and burnish it down, which we were not able to do in the early days in a gold filling, because the edges were thin. If the edges could not be made thin, we had to bevel them more, whereas with the inlay the edges can be beveled very little and the overlapping inlay made very thin.

The portions that Dr. Hofheinz referred to, are contained in a paper read before this society in 1877, in which I first pronounced the Arthur craze as passed, and acknowledged that I had been

affected with it, and advocated the perfect restoration of the shapes of the teeth, as well as the practice of what has since been called "extension for prevention." Here is an extract:

As to the danger of allowing the teeth to stand in contact, I am willing to grant all that may be claimed by the most uncompromising advocate of separations. But I know of no way of accomplishing this separation so securely as by cutting the teeth away enough for this purpose in preparing the cavities, and then restoring their shapes with gold.

It has been generally considered that the permanent separation of the teeth is accomplished only by cutting them apart. It has either not been observed, or it has been forgotten that the teeth can be, and with larger proximate fillings necessarily are, permanently and securely separated by the perfect restoration of contour.

Occasionally there comes under our observation a perfect, or nearly perfect set of teeth. The teeth stand firmly together, the gums are safe, and the occlusion perfect. Such a natural condition exists that the patient is not even conscious of having teeth. We are struck with admiration as we linger over this example of nature's perfect work.

In a large number of the mouths that come under our care we can have practically the same condition. Large fillings may be required, but if they are properly shaped the same healthy gum and perfect occlusion may be secured. If the teeth have been sadly mutilated and displaced before coming into our hands, our task may be a trying one. In many cases it may be so difficult that, considered in all its relations, it will be unwise to attempt it. If we are not very perfect operators, it may not be wise to attempt it at all. But if we have entire charge of the patient from the time of the eruption of the teeth, this very desirable condition may be secured far more easily.

Let us then consider how it may be accomplished, as well as how we may secure more lasting operations on the proximate surfaces, as was promised in the beginning of this paper.

Let us take an imaginary case. Two small cavities appear on the proximate surfaces between the bicuspids. We will suppose the operator to be opposed to permanent separations; therefore, the teeth are wedged apart to give room to insert the fillings. After the operation they settle back in contact as before.

Two or three years go by, when an examination reveals a recurrence of decay about the margins of the fillings. Again the teeth are wedged apart, the fillings removed, the cavities somewhat enlarged and refilled as before. A few more years elapse, when again a recurrence of decay is discovered. Once more the teeth are wedged, though not so far this time, for now the cavities are so large that it is evident that it will be necessary to cut down from the grinding surface, as well as to cut away all the softened tooth-structure that was in contact. The cavities are filled, the shapes of the teeth restored, and this time many years go by, and still there is no sign of a recurrence of decay.

How shall we account for the failures, as well as for the final success?

The first and second time the fillings were so inserted that the teeth still remained in contact, and having failed to change the conditions which first induced decay, we might have expected its recurrence in due time. The last time they were so large that their margins were exposed, except at the cervical wall, and the teeth could not rest in contact.

Let us take a hint from this. In the first place, if these cavities had been sufficiently enlarged to allow the margins of the fillings to become just free on the buccal and lingual side, and along the grinding surface border, and the gold had been rounded out instead of being filed flat, the teeth would have been comparatively safe.

Here let me say that to expose the edges of the fillings the cavities need not be so very much enlarged, if the gold is well rounded out. In some few cases, where it is desirable to keep the gold out of sight, the contour may be even slightly exaggerated, as in that way the margins of the fillings will be free and safe, without extending so far out toward the buccal surface.

If the small cavities are enlarged in this way there is also greater certainty of securing perfect enamel margins, for the influence of decay on proximate surfaces often spreads further from the cavity proper than may seem at first sight.

I think it may be accepted as a safe rule that the smaller the fillings on proximate surfaces the greater the danger of early failure, and the larger they are the less danger of a recurrence of decay.

A pin-head filling, placed on the proximate surface of one of my bicuspids by Dr. Varney, failed in two years. Large contour fillings on the proximate surfaces of the molars, and of one bicuspid, made by him at the same time, have now stood eight or nine

years with no sign of failure. I know of no fillings that can be, in the very nature of the case, more secure than those very large ones that extend up under the gum, and well out upon the lingual and buccal surfaces of the teeth. The cervical margin is covered and protected by the gum, and the lingual and buccal borders are so exposed to the friction of food and the washing action of fluids as to be kept clean almost without the use of the brush.

If this reasoning is correct, it follows that the more frail the teeth the larger the fillings should be made, and, on the other hand, the better their structure the less danger in leaving the fillings small.

It is generally said that some teeth are so frail that they must be permanently separated. It is my firm conviction that such teeth are the ones that need restoration most; even restoration may not save them, but it will preserve them longer than any other method with which I am familiar.

It is so easy, however, to be misunderstood, that I must here say, that even if the perfect restoration of very frail teeth be absolutely the best method, yet I am not willing to advocate its too general adoption.

In the hands of a few accomplished operators, and for those patients who are able to seek the best services, and are willing to expect final failures, such operations, in my judgment, are the best that modern dentistry has to give. But in the hands of most operators, and for most patients, I think that perhaps better results with such teeth may be expected from permanent separations, even though they be attended by many of the evils I have described. If restorations with gold cannot be well performed they had better not be attempted at all. In such cases perhaps restorations with amalgam may have advantages sufficient to overcome its defects as a filling material.

In most cases I should prepare my cavities in accordance with the following general rules: Teeth of good structure, in a healthy mouth having small cavities, may be filled without cutting till the margins are free. Teeth of medium quality should be cut till the margins of the cavity are just free on the buccal and lingual sides, and if not cut through from the grinding surfaces, should yet be cut so as to allow the gold to come in sight along the proximo-grinding surface borders, after the teeth have closed. Then the only danger exists at the cervical margin. In very frail teeth even small cavities may not be safe until cut up to, and sometimes even under, the gum.

It was to this paper that I referred this morning, stating that it seemed to me the so-called doctrine of "extension for prevention," although that term was not used, had been here clearly stated and outlined. It seems to me to be a clear statement of the modern and conservative application of that practice, which I stand for today as I did then, and as far as I know it is the first one made in our profession; I had searched the literature, as far as I could, before that, and have never found, since, anything antedating it, clearly stating the principle of extension for prevention. I made the allusion this morning not to bring this question up, because if the profession did not notice it and give me credit therefor, let it pass; but I wish to emphasize the fact that the gold inlay gives us the opportunity today of making better margins than can be obtained by the old way, because the edges can be spread out thinly along the lingual borders in such a way that a beautiful effect can be obtained that was not obtainable before with gold fillings.

I said that I was sure to be misunderstood, and Dr. Gillett's discussion showed that he misunderstood me somewhat; but this only proves how easily men misunderstand each other, unless they have the clinical patient or an example before them. I have felt for a long time that Dr. Gillett and I advocate nearly the same principles. This morning we seemed to differ on the question of frail walls. I said nothing about these in my paper—I took it for granted that anyone would cut away frail walls—but referred to the sound tooth structure which I thought might be saved by more conservative methods.

His allusion to the matter of amalgam fillings shows that we are in accord. I never saw better finished amalgam fillings, or better indicated, than those that came from his hands, and such careful use of amalgam constitutes, to my mind, a justification for its employment.

My contention for the avoiding of the cutting away of tooth structure is not aimed at all at such work as Dr. Gillett does, but against the indiscriminate, care-

less, hasty, and ill-considered cutting away with the aim of securing a big hole, without strict regard to the conditions involved.

I am also entirely in accord with Dr. Hofheinz's discussion. See what good sense he shows in his mild criticism! It is the greatest pleasure to hear differences expressed in the manner he expresses them. As far as our views are concerned, I am convinced that we are in close harmony. That is the benefit we derive from getting together and coming to an understanding.

The criticism Dr. Hofheinz made of my samples is a very just one. I had occasion to lecture during the past winter at the University of Pennsylvania, and those samples were made up in a minute, almost. I had the inlays made as quickly as possible, to show them to the students. They were not intended to be shown here; but I have not had time to have a series of inlays made which would have fully illustrated my ideas. I would never think of putting in the human mouth a filling of any kind against such a frail wall as is shown here [illustrating] without protecting the thin edge of the tooth. It would not take a week to crush the wall right off in any ordinary person's mouth. I expected to be misunderstood, but it did not occur to me how much I was open to criticism by showing these specimens.

The bicuspids shown were intended only for one purpose—namely, to show the students that there is a way of getting the inlays in without cutting through the masticating surface, and without sacrificing any more tooth tissue than can be helped, at the same time avoiding the possibility of discoloration from the use of gold inlay on the buccal side.

Dr. Hofheinz. Then my contention was right? If these were in the mouth, you would not hesitate to cut away enough for that?

Dr. Perry. Yes; you were entirely justified in speaking of that. Perhaps that inlay between the bicuspid and the molar should not have been shown. That thin wall broke off when I set it, but the cement was mixed, and I tapped the broken piece in, and there it has been ever since. It answered my purpose of demonstrating to the students. It impressed on the minds of these young men the principle of putting in a large inlay in that form to protect a thin wall, even though I neglected to do as I should have done—cover the enamel with the gold to protect mastication.

I will say again that in citing this old paper of mine I did not wish to bring up the question of who advocated extension for prevention first. Dr. Darby has said to me: "Perry, if you do not set yourself right on this, I will do it for you." Just now, however, it happened to be natural to refer to my paper which was read before this society in 1877, and in which was advocated the protection of the teeth by filling, which can now be so much better obtained by the use of gold inlays.

Dr. F. Milton Smith, New York. I did not hear the reading of Dr. Perry's paper, and therefore cannot discuss it; but I cannot forbear just a word in reference to the former paper Dr. Perry mentioned, for the following reason: My professional life began just one year previous to the date of that paper—I began just in time to read this paper by Dr. Perry, portions of which he has read to us. If there has been anything helpful to me, it has been that paper, which I read after I had been in practice one single year. He has presented the principle of "extension for prevention" in the most intelligent way, and if I have been of any service to my patients it has been because of that article, and Dr. Perry's work which I have seen since, with that of other men of a similar character.

When listening to the reading of the extract from that paper of Dr. Perry, I turned to Dr. Gaylord, before mention had been made of priority, and I said: "Does that not antedate by quite a bit any mention of extension for prevention by any other man?" As far as I know, it is the first intelligent suggestion which would lead dentists to extend the cavity to lines of safety. Dr. Perry has made one remark which explains to me

something about which many of the so-called Black advocates have muddled and left us in the dark, namely: "It is not necessary always to make a large filling, to make it safe." If the filling is properly shaped and contoured, so that the gold extends to visible surfaces, it is perfectly safe.

Presentation of the Fellowship Medal.

President Nash appointed Drs. W. W. Walker and S. G. Perry to conduct Dr. N. S. Jenkins to the platform in order that the Fellowship Medal might be presented to him.

Dr. Jenkins was introduced to the audience by Dr. Nash, who spoke as follows:

Dr. Nash. Before presenting the Fellowship Medal it would seem appropriate to review the history of its foundation.

In 1905, through the thoughtfulness and generosity of our esteemed fellow member, Dr. William Jarvie, a fund was established known as the "William Jarvie Fellowship Gold Medal Fund," the income of which was to be applied for the purpose of providing a gold medal for presentation to the one recommended by a standing committee as being distinguished in scientific attainments, original research, and who by his professional career had materially aided and advanced the science and art of dentistry. The previous awards of this medal were to—Dr. G. V. Black, Chicago, Ill.; Dr. Truman W. Brophy, Chicago, Ill.; Dr. Edwin T. Darby, Philadelphia, Pa.; Dr. William Jarvie, Brooklyn, N. Y.; Dr. W. D. Miller, Berlin, Germany; Dr. Eugene S. Talbot, Chicago, Ill.; Dr. M. H. Cryer, Philadelphia, Pa.—and no one will question the wisdom of their preferment for this distinguished honor.

That you, Dr. Jenkins, should have been chosen as one equally worthy, is proof of the high estimate that has been placed upon your contributions to our professional equipment, and an evidence of our regard for one who has so eminently dignified his profession.

I am indebted to Mr. Leonard A. Jenkins, a son of Dr. Jenkins, for the following sketch of his career: Dr. N. S. Jenkins was born of Puritan and Pilgrim blood, in Falmouth, Mass. His family later moved to Bangor, Me., where his father engaged in the lumber business on a large scale. Having a distaste for a business career, Dr. Jenkins chose dentistry as his profession, and after completing his studies practiced for a while in Bangor, but was unable to endure the rigorous climate. The opportunities for professional advancement in Europe were extremely attractive at that time, and in 1866 the doctor and his wife set sail to seek their fortunes, going first to Berlin, Germany, and later, through the advice of his beloved friend, Dr. Frank P. Abbott, settled in Dresden, where he continued to practice for more than forty years. He established in time one of the largest and most important practices in Europe, and his unusual skill attracted patients far beyond the confines of Germany, and resulted in repeated calls to Austria, Russia, Italy, and even Turkey. The King of Saxony bestowed upon him the order of the Knight of the Albrechts Order and also conferred upon him the title of Hofrat, or privy councilor. As soon as he could spare some of his time from earning a living he devoted himself more and more to investigation and original research. The first important discovery Dr. Jenkins announced was in 1898, when he gave to the profession a porcelain of sufficiently low melting-point that it could be fused in a gold matrix. This was followed several years later by another contribution to ceramics, in what he termed "prosthetic porcelain," and this in turn led to his porcelain prosthetic work on an iridio-platinum basis. Not only has Dr. Jenkins been a valuable contributor in the field of porcelain and in the advancement of mechanical dentistry, but his latest researches have carried him into the domain of oral hygiene and mouth sterilization. He has been identified for a number of years with the section of Hygiene in the International Dental Federation, has been president of the American Dental Society of Europe and of the Dental Club of Paris,

and is an honorary member of numerous dental societies in this country and in Europe.

About three years ago Dr. Jenkins retired from active practice in Dresden and moved to Paris, where he has specialized in restoration by porcelain bridges and has preached the gospel of esthetic dentistry.

With this data as a basis for judgment, can there be any question of Dr. Jenkins' fitness for the highest tribute we have at our disposal in recognition of the obligation we as a profession owe to him?

It now becomes my special privilege and pleasure to present, in behalf of this society, the Fellowship Medal to Dr. NEWELL SILL JENKINS of Paris, France, in token of our appreciation and of his deserving, and to pronounce him a Fellow of the Dental Society of the State of New York.

Dr. JENKINS responded as follows: *Dr. Nash, and members of the New York State Dental Society,*—No man lives to himself alone, nor of himself deserves special credit for his achievements, for he is largely dominated by his heredity, and at best reflects in some degree the spirit of his time.

In listening to the kind and flattering words of your president, and hearing the names of the eminent men with whom my name is now associated as possessing the honor of fellowship in this distinguished society, I am moved, not to pride, but to deep humility. My professional career has been modeled upon that of the revered Abbott of Berlin. My so-called contributions to porcelain art have been the natural outgrowth of the work of Rollins and Land, and of the dental manufacturers here and abroad. I am deeply indebted to the researches of numerous ceramic workers in various parts of Europe, but above all to the intelligent, patient, and devoted co-operation of my beloved wife, for what I have done.

As I said yesterday, not I, but Sachs, discovered the possibilities of the gold matrix. There is no step which I have taken in the way of sterilization of the mouth but has been based upon the researches of Black and Miller, and the labors of many other great bacteriologists of Europe and America. Therefore I stand before you as one who thoroughly feels himself unworthy of the great honor you have conferred on him, but deeply grateful for this crowning distinction at the close of a long and laborious professional career. Brethren of the New York State Dental Society, be pleased to accept my grateful thanks.

After the reading of the report of the Executive Council the society adjourned to meet at 2 P.M.

(To be continued.)

THE DENTAL COSMOS

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Devoted to the Interests of the Profession.

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PHILADELPHIA, NOVEMBER 1910.

EDITORIAL DEPARTMENT.

THE INTERNATIONAL HYGIENE EXHIBITION.

AT a convention of health workers assembled in Dresden in 1906, to which the German imperial and state governments had sent delegates, it was unanimously decided to hold an international hygiene exhibition in Dresden in 1911, and to thus bring before the professional world and the general public the mighty acquisitions of modern hygiene in a comprehensive form, universal in scope.

In setting forth the purposes as well as the animating motives of this exhibition, it is recognized by its projectors that "Hygiene has become today of capital importance to our whole life, and it is destined to enjoy a future surpassing all expectations. Although the last century brought external culture and its technical appliances to a height of perfection never before attained, inner culture, the care of man himself, made little or no advancement. The feverish competition which seized upon all branches of human activity led inevitably to an overtaxing of

strength which threatens in time to destroy the equilibrium of health. As a simple reaction against the exaggerated valuation of external culture, the new century demands a return to the care of man himself."

Twenty-five years ago the science of hygiene was in its infancy, without formal representation in the educational scheme of any university; today all universities have their hygienic departments, discoveries in bacteriology have multiplied the possibilities of saving human life, the systematic study of hygienic living has directly affected commerce and technical industries, has shaped legislation, and has aroused the public mind to an appreciation of the health-conserving and life-saving value of hygienic science, so that humanity as a whole is learning the value of health as a communal as well as a personal asset.

Hygiene as a science, and in its practical applications, demands consideration in relation to all human activities; the general recognition of this fact is creating a public demand for knowledge of everything that the science and art of hygiene can bring to bear upon the betterment of living in all its phases. Recognizing the widespread interest in the subject, the projectors of the Dresden Hygiene Exhibition, under the patronage of the King of Saxony, have organized the exhibition upon a most comprehensive plan, and are inviting exhibits from the whole family of nations to illustrate the science of hygiene and its practical applications to every phase of human relationship and activity. It is the intention of the directorate to make this the most complete portrayal of hygiene ever attempted, so that it shall not only constitute the greatest educational effort in the cause of human betterment that has yet been undertaken, but that it shall also, as the result of its educational influence, be the means of materially improving the conditions of living and the health status of humanity in general.

Among the special groups of subjects for which provision has been made is that relating to "Diseases of the Teeth," under the presidency of Professor Otto Walkhoff of the University of Munich and with Professor Dieck, director of the Dental Institute of the University of Berlin, Professor Jessen of Strassburg, and Dr. Schaeffer-Stuckert of Frankfurt a. M. as vice-presidents.

It is the aim of those having charge of the group dealing

with diseases of the teeth "to present a complete picture of all the advances which dental science has achieved in hygiene, and to demonstrate how closely dental science is associated with the success and progress of modern hygiene." In order to secure the comprehensive presentation of the proposed demonstration, the relationships of the teeth to hygiene will be presented in an exhibit comprising nine general divisions, each with numerous subdivisions, the principal groups being—

(1) Anatomy. (2) The Causes of Tooth Destruction. (3) The Physical Expressions or Appearances of Tooth Disintegration. (4) Sequelæ of Tooth Destruction. (5) Extension of Dental Diseases. (6) Prophylaxis of Tooth Disorders. (7) Treatment of Dental Diseases and their Sequelæ through Mouth Hygiene. (8) Public Dental Service. (9) Literature.

With this comprehensive plan as a basis for its special work and under the able direction of its well-chosen executive officers, it cannot be doubted that the dental section of this great exhibition will bring out results of the greatest significance for the cause of hygiene in general. It is of the utmost importance that the activities which now characterize the dental hygiene movement in America shall be adequately represented. School inspection and the dental care of school children, the influence of dental disorders upon mental backwardness in school children, the relations of dental service to the army and navy, and the public service of dentistry in hospitals, prisons, etc., are lines of activity which have been rapidly developing in importance in this country, and the results of this movement should be presented for comparison and study in connection with the work of other nations in the same field at the Dresden Exhibition. We would suggest that the Dental Hygiene Council of our National Association, as well as similar committees of state and local societies, take such action as may be necessary to secure a proper exhibit of the range and amount of dental hygiene work accomplished in America, and present it at the Dresden Exhibition.

The American representatives of the section on Diseases of the Teeth are Dr. William H. Potter of Boston and Dr. Truman W. Brophy of Chicago.

The Dresden Exhibition will be open from May until October 1911.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Zahnaerztliche Rundschau*, Berlin, July 24, 1910.]

ALYPIN IN DENTAL PRACTICE. By Dr. Eisert, Munich.

Eisert has employed alypin in several hundred cases of regional as well as infiltration anesthesia in stomatological operations, such as curettage, resection, etc., also in mandibular anesthesia and simple extractions of from one to five teeth, and has found it to be a thoroughly reliable and very effective local anesthetic of great power of penetration. Alypin has a prolonged anesthetizing effect, does not irritate the mucosa, and causes neither after-pain nor secondary hemorrhage. Anesthesia is established very readily, for simple extractions in from three to five minutes after the injection, in mandibular anesthesia in from twenty-five to thirty minutes. The general condition of the patient is not affected, even major operations such as resections of the jaw having been performed without any untoward symptoms. The healing of the wound takes place rapidly. If one remembers the many accidents that have occurred in dental practice from the application of cocain, every operator will be glad to substitute a less dangerous anesthetic such as alypin, which, while being considerably less toxic, possesses all the advantages of cocain.

[*Lancet*, London, May 7, 1910.]

PROGRESSIVE DESTRUCTION OF THE TEETH SOCKETS: CHRONIC GENERAL PERIODONTITIS (PYORRHEA ALVEOLARIS, ALVEOLAR OSTEITIS, INTERSTITIAL GINGIVITIS.) By J. F. Colyer, London.

In his remarks on pyorrhea alveolaris the author intends to draw attention to the following points: (1) The morbid anatomy of the disease, (2) the clinical appearances and symptoms, and (3) the relation of the clinical appearances to the destruction of the bone.

The first change noticed in the human maxillæ is the disappearance of the bone between the teeth, leading to the formation of spaces. The next stage is marked by further destruction of the bone, the whole tooth socket being gradually involved. The bone immediately bordering the tooth disappears first, and so produces cup-like spaces around the teeth. The condition of the bone to the naked eye then presents the appearance of osteoporosis or rarefying osteitis. In specimens showing more advanced stages the bone forming the tooth sockets will be found almost destroyed, affording but slight hold for the tooth. In the maxilla, especially in the region of the molars, the bone is more involved in the disease than is the case in the mandible; this is to be accounted for by the different nature of the osseous tissues in these two bones. Irregular patches of calculus will often be seen on the teeth near the necks, and at times the surfaces of the roots will be found completely covered with an irregular dark brown deposit. In some specimens the extent of the changes around the teeth appears to be slight, the margin of the alveolar process having receded, but the bone itself presenting a sclerosed rather than an osteoporotic condition. In these specimens, too, a considerable thickening of the outer alveolar plate will at times be noticed. Animals that have been subject to this disease exhibit similar though more marked changes. Microscopic investigation of the tissue has not been carried out to any considerable extent.

The clinical appearances in the earliest stage of the disease show a slight congestion of the gums, that normally fit closely around the teeth, and by passing a probe into the interproximal spaces it can be shown that the gum has undergone a certain amount of destruction. The whole of the gum margins becomes congested and bleeds readily. The interstitial gingival tissue then gradually disappears and the normal festoons become obliterated.

An examination of the teeth at this stage

will usually disclose in the approximal spaces food and other débris, while small nodules of calculus are generally present on the teeth. If the gums are compressed a small quantity of discharge may be seen escaping by the side of the teeth. Finally, the bone becomes involved in the inflammatory process, and, with the pericemental membrane, is gradually destroyed, and the muco-periosteum gradually recedes. The recession of the gums does not usually proceed as quickly as the destruction of the alveolar process, with the result that around the teeth deep pockets are formed, and in these pockets pus and other morbid material accumulate and so aggravate the condition.

At this stage the mucous membrane will appear deeply congested, the gums are swollen at their free margins, and bleed readily at the slightest touch. The roots of the teeth are more or less exposed, and covered with a layer of hard greenish-brown calculus; there is a fetid discharge, and the breath has a repulsive odor due to indol-forming organisms. A sickly sour odor of the breath is noticeable when yeasts and bacteria causing carbohydrate fermentation are present. The teeth are freely movable, and may become so loose that they can be removed quite easily. If the disease is left untreated the teeth are lost one by one, and with the loss of the teeth the inflammatory process invariably clears up.

In advanced cases superficial glossitis is often present, and the tonsils and pharyngeal mucous membrane are also inflamed. An unpleasant taste is experienced in the morning. There is constant hemorrhage from the gums, which is swallowed during the day, but at night it occasionally escapes from the mouth and stains the pillow. This latter symptom is worthy of special attention, as it may be mistaken for hemorrhage from the lungs.

The clinical appearances of the disease, which vary considerably, are determined by the general condition of the patient, the resistance of the tissues, and the hygiene of the mouth. At one period the condition may be acute, with a free flow of pus from the tooth sockets and a rapid destruction of the tissue. This state of evanescence is perhaps followed by a period during which the inflammation may be only slightly marked.

In some cases the teeth are comparatively free from calcareous deposits; in other cases they are completely coated. The disease, too, may be more active around the anterior than the posterior teeth, or *vice versa*. Again, the destruction of tissue may be more active in one region of the mouth than another. This is exemplified in the case of the incisors and canines, the destructive process being often more advanced on the palatal than on the labial aspect. In severe cases the disease may spread in the maxilla to the antrum, or in the mandible to the body of the bone.

In some cases where the hygiene of the mouth is carefully looked after, the gums appear fairly normal in color, and abnormal looseness of the teeth is the only indication of the presence of the disease. In these cases the probe discloses deep pockets, and on pressing the gum a discharge can be expressed from the tooth sockets. In a few cases the disease is slow in its progress, and the surrounding bone actively reacts to the injuries caused by the toxic products in the pockets.

In certain cases there seems to be a tendency to the formation of granulation tissue, causing the condition to simulate sarcoma. In one case under observation associated with myxedema, the gums were friable and presented a translucent appearance.

The disease may often be well advanced without the patient being conscious that anything is wrong, the only symptom being a tendency for the gums to bleed readily, and this is often unheeded by the patient. With the formation of spaces between the posterior teeth, neuralgia, arising from irritation of the exposed cemental tissue, may be present. In the later stages there is often persistent neuralgia owing to the main trunks of the nerves being involved in the disease process. Where pus formation is active the patient will often complain of a general itching of the gums.

Whether the disease can be transmitted from one individual to another is an open question, but the balance of evidence is rather against it.

In patients of a gouty diathesis, the clinical appearances present certain features which are typical, and in the opinion of some the periodontitis is considered to be closely associated with the uric-acid diathesis. According to these authors, gouty periodontitis seldom manifests itself before the age of thirty, and

in most cases the patient has reached the age of forty-five to fifty. There is usually a well-marked history of gout. In the earliest stages there is a gingivitis, the teeth are often free from caries and show signs of well-marked attrition. Subsequently the periodontal membrane becomes involved, causing recession of the gums and absorption of the alveolar process. The mouth may remain in this condition for years.

The margin of the gums presents a thickened appearance, which is probably due to a productive inflammation of the muco-periosteum. An examination of the sockets with a probe will not disclose any deep pockets or much calculus. At intervals synchronous with a lowering of the standard of general health, the gums will appear congested, a catarrhal-like discharge or even pus may exude from the pockets, and the teeth will become sensitive to pressure, the inflammatory process appearing to involve the whole periodontal membrane; the teeth will be hypersensitive to thermal changes, and the patient will often complain of shooting pains in the region of the alveolar process. The oral condition improves with that of the general health, but the roots of the teeth will be left a little more exposed. The attacks tend to become more frequent as age advances, and one or two teeth during each attack appear to be singled out, as it were, for an extra dose of the specific poison. The inflammation in the tooth or teeth may stop short of suppuration, but even when a general improvement has taken place a distinct looseness of the tooth or teeth persists. During a subsequent attack the tooth becomes extremely loose, and the gum overlying the upper half of the root may become swollen and a fluctuating swelling appear. An incision into the swelling will disclose a glairy, mucus-like fluid, or even pus.

If the swelling is not incised it may break externally, or the fluid may wend its way toward the gingival margin and so discharge at the neck of the tooth. An examination of the tooth will disclose a living pulp. In such teeth a rapid destruction of the periodontal membrane and alveolar process takes place and the teeth become quite loose and are lost. With the advance of years the attacks occur with increasing severity, the teeth becoming loose partly by the destruction of the membrane commencing at the gingival margin and partly by acute exacerbations in one or two teeth as mentioned above.

Clinical appearances alone are not altogether satisfactory guides as to the extent of the disease, and it is only by the aid of radiography that the extent of the bone destruction can be estimated with any degree of accuracy.

The author's article is accompanied by a very liberal series of clear illustrations of clinical cases and of radiographs.

[*Zeitschrift fuer Zahntechnik*, Vienna, July 25, 1910.]

AMALGAM CROWNS. By G. Rohn.

If the crowns of bicuspids or molars have been partly or entirely lost by caries, or if a strong support for bridge work is required, or the patient is financially unable to have a gold crown made, the author, following Julius Witzel's suggestion, applies an amalgam crown in the following way: After preparing the tooth by removing all softened dentin and weak enamel margins, filling the canals and making undercuts, a square pivot bent in knee-shape, the ends of which have been roughened, is cemented in the canal. Then a close-fitting celluloid ring that has been festooned so as to correspond to the gingival borders and the articulation, is slipped over the root. These celluloid rings are easily and cheaply made from ordinary celluloid strips, the ends of which are painted with collodion or pure acetic acid, laid over one another, and held together for a short time with slightly heated pliers. After slipping this celluloid matrix over the root, the protruding end of the pivot as well as the base of the root are coated with thinly mixed cement in order to increase the adhesion of the amalgam, and to reduce the contact of the amalgam with the pivot. The amalgam, from which as much as possible of the mercury has been pressed, is packed into the ring with foot-shaped Abbott pluggers, the occlusion is observed, and the patient told not to bite on the crown for a time corresponding to the period required for the crystallization of the amalgam used. On the subsequent day the cusps, contours, and points of contact and articulation are finally shaped with disks, burs, etc., after the celluloid matrix has been removed with a heated spatula. To

satisfy esthetic demands, porcelain facings can be used, the pins of which are bent around the pivot in bracket shape. If a bridge becomes necessary, these amalgam crowns may be prepared for gold abutment crowns.

[*Les Annales Dentaires,* Paris, June 1910.]

TREATMENT OF ORAL DISEASE DURING PREGNANCY. By Dr. J. Tellier.

The procedure of treatment of oral disease during pregnancy as indicated by various authors is rather vague and indefinite. In case of odontalgia it is generally advised to desist from medication; instead, treatment based on the etiology of the disease should be immediately instituted. If the pain after a careful examination is found to be due not to profound caries, but to paradental congestion of the circulatory system, local bleeding of the gingival tissue by puncture, scarification or superficial cauterization, followed by the application of a soothing dressing of chloroform, tincture of aconite, and tincture of iodin is indicated. If the pain is due to caries the usual treatment is to be immediately instituted, also all superficial caries must be attended to, since its progress during pregnancy is a very rapid one. Such treatment is not always easy, as the sensitivity of the dentin is generally increased, and cases have been reported in which the painful filling of teeth was followed by miscarriage. These cases are, however, extremely rare, and by careful and gentle procedure, application of suitable remedies for the hypersensitivity of the dentin, temporary filling with gutta-percha or cement, and careful watching of the progress of caries, the patient can be greatly benefited. In case of pulpitis an arsenous dressing is applied, and the pulp is removed when there is no longer any pain, yet no permanent filling is to be inserted. If extraction becomes imperative owing to impossibility of conservative treatment or danger of serious infection of contiguous parts, the operator should not hesitate, for, while it is true that extraction has been followed by miscarriage in very rare cases, serious abdominal surgical operations have often been performed without serious results. The fetus may be more seriously injured by the continual pain which the mother is suffering, by her loss of sleep and general depression, than by the minor operation of extraction, which the author performs under nitrous oxid anesthesia preferably to cocain. If a more serious oral operation is necessary, even ether may be administered after consultation with the family physician.

Pyorrhea in pregnant women should be treated like all pyorrhea. If taken care of early, the usual cleansing at the necks of the teeth, together with hygienic measures, such as moderate use of the brush, antiseptic rinsing of the mouth with neutral oxygenated water and alkaline solutions, will in light cases serve the purpose. In further advanced cases, several sittings at intervals of several days become necessary, and the gingivæ may be touched with a weak solution of chromic acid. Sometimes astringents may be prescribed. In granulating proliferation of the gingivæ at the level of infected roots cauterization may be applied, or, if necessary, the roots extracted.

As for prophylactic treatment in regard to the decalcification of the teeth occurring during pregnancy, the phosphates which are generally prescribed are of doubtful value, as their assimilation has not as yet been fully proved. Mother and fetus are probably sufficiently benefited by a careful diet selected with a view to a sufficient quantity of calcium salts.

[*Proceedings of the Royal Society of Medicine,* London, March 1910.]

SOME EXPERIMENTS ON THE RELATIVE SUSCEPTIBILITY OF DIFFERENT TEETH TO DENTAL CARIES. By S. P. Mummery.

The theory held by Dr. Sim Wallace and others that all teeth are susceptible in an equal degree to dental caries is difficult to reconcile with the facts of daily observation. We not infrequently meet with mouths exhibiting all the exciting causes of dental caries, mouths in which quantities of soft carbohydrate food lodge between and around the teeth after every meal and there undergo active fermentation, and yet little or no dental caries results. Other mouths we see where the most scrupulous attention is paid to oral hygiene, and all food particles are removed by the brush several times a day, and where, nevertheless, the most active caries progresses. We all know of cases

where the teeth seem literally to tumble to pieces in spite of most careful cleansing and constant visits to the dentist, and this often in mouths where the teeth are perfectly regular and the gums in perfect contact with the teeth. For this reason various clinical types of "hard" and "soft" teeth have been distinguished, yet Black's investigations on the relative quantities of organic and inorganic components in teeth in their relationship to susceptibility to caries yielded a negative result, which has been corroborated recently by Gassmann's series of analyses. (See DENTAL COSMOS, June 1909, page 762.) From these investigations it appears that the third molar, which is very frequently attacked by caries as compared with the other teeth, actually contains more calcium than the canine teeth. Miller pointed out that the difference in degree of susceptibility lies probably in the degree of chemical combination between the organic and inorganic matter. The importance of experimenting with the enamel rather than the dentin scarcely needs emphasizing, for the enamel is the only part of the tooth which is exposed to the acids of decay in the first instance. It is in the enamel, and the enamel alone, therefore, that any resisting power against the action of acids must lie, and if any differences really exist between those teeth clinically distinguished as "hard" and "soft" teeth in their reaction to the acids of decay, those differences are to be found in the enamel alone. The author's experiments are therefore concerned entirely with the enamel, freshly extracted sound and partly carious teeth being used. The decalcifying solution applied was lactic acid of the strength of 0.075 per cent. The experiment with each tooth was regarded as finished when the surface presented a chalky appearance, and a fine white powder could be scratched off by a needle. Contrary to expectation, the tips of the cusps of the molars and bicuspids and the cutting edges of canines and incisors invariably showed the earliest signs of milkiness, and later of chalkiness. Why these situations are not the first to be attacked by caries in the mouth is of course easily understood, since they are the positions of all others which are kept the freest from food particles by the tongue and opposing teeth. It was frequently observed that a patch of enamel on the labial or approximal surfaces would show no sign of acid action, long after the other parts of the tooth were deeply disintegrated by the acid. The experiments were extended over four weeks, and it was clearly shown by the record, comprising one hundred teeth of all descriptions, that there is a marked difference between the teeth in their powers of resistance to the acid. Those teeth which in the experiments reacted to the acid in the shortest time would, in the mouth, probably decay in early life, while those which withstood the action of the acid the longest, would in many cases remain free from caries throughout life. Thus in clean mouths with regular teeth and healthy gums, where very little opportunity for the lodgment of food occurs, teeth of comparatively low resisting power might remain free from caries quite as long or longer than teeth of a higher power of resistance would do in dirty mouths with teeth offering many crevices for food to collect. At the same time teeth of very low resisting power will give out in a short time, in spite of the most favorable conditions, and, again, teeth of very high resisting power will remain sound in spite of constant exposure to fermenting food for very many years.

The resistance of the teeth to caries is different in various conditions of disease, especially in most febrile diseases of long duration, such as typhoid fever, when all food has a greatly increased tendency to ferment, owing partly to the increased temperature and largely to the diminished flow of saliva. It has also been asserted by several writers that teeth vary in their resisting power to dental caries at different periods of life by the addition or subtraction of calcium salts from their composition, as, for instance, during pregnancy. The author believes this to be the case only as regards the dentin, and with Professor Röse's authority behind him, considers it inconceivable that the enamel can change in its power of resistance to the acids of decay after the formation of the teeth.

In conclusion, the author divides the etiologic factors of dental caries into the usual two classes, viz, predisposing and exciting. The predisposing causes consist of the susceptibility of the teeth, the exciting causes the exposure of the teeth to the action of

decalcifying acids from whatever source. These exciting causes may be modified in many ways, but since they are invariably the result of the acid fermentation of carbohydrate food around the teeth, they are obviously dependent upon the shape and arrangement of the teeth, and upon the nature of the food which is eaten. These variations in susceptibility may either be acquired or inherited. If acquired, they must be determined during the period of deposition of the enamel by the enamel organ, malnutrition during that period probably resulting in an imperfectly formed tissue, as evidenced by the well-known condition of hypoplasia of the enamel. Since, however, the hypoplastic teeth used in the experiments showed a very average power of resistance to acids, the theory that susceptibility to caries is an inherited condition gains strong support, together with the fact that very bad teeth and also very good teeth often run in families. The fact also that certain teeth seem especially liable to decay in all the members of some families lends additional support to this view.

[*Deutsche Zahnaerztliche Wochenschrift*, Munich, June 4, 1910.]

CASTING ALUMINUM PLATES. By Dr. Lengler, Neunkirchen.

After taking the impression, a model is cast with a mixture of one part of plaster, one part of Spanish white, and two parts of powdered asbestos, mixed with water. This material is fire-proof, and does not check on being heated. On this model the plate, of about 1 mm. thickness, is modeled in casting wax. At the center of the plate an iron sprue wire of from 4 to 5 mm. thickness is fastened perpendicularly with wax. The above-described investing material, thinly mixed, is painted with a hair brush over the wax plate and model, avoiding bubbles, and the whole is invested in the flask. After the investment has hardened, a cup-shaped depression is cut around the sprue wire, sufficiently large to hold the molten metal. The flask is set over a low gas flame, and the sprue wire is carefully removed after about fifteen minutes, while the flask is held downward so that no particles of investment material can fall into the sprue-hole, the mouth of which is rounded—while the flask is still held downward—in order to avoid sharp edges which in casting might be broken off and carried into the form. The flask is then again set on the gas flame, and heated for from three to four hours, until no more smoke due to the burning of the wax escapes from the sprue-hole. The flask is then heated with the blowpipe until the interior of the investment material glows. The aluminum is then laid in pieces in the crucible and melted until the crucible is almost full. The flask is set under the press, the piston of which has been mounted with a wet asbestos disk. The aluminum is kept glowing for another two minutes, and the press is then closed. Five minutes after casting, the flask is immersed in cold water, and the plate is cut out of the investment. The plate will be found to reproduce even the most minute detail of the rugæ. After removing the excess of metal, the plate is ready for the mounting of the teeth with rubber.

The teeth may also be cast directly to the aluminum plate. The teeth are set up on the casting-wax plate, platinum-pin teeth being selected for the six anterior teeth, diatorics for the posterior ones. After trying the plate in the mouth, the wax model is finished carefully, especially on the lingual side of the posterior teeth, and only the pins of the anterior teeth are left uncovered with wax, since aluminum must not be cast together with platinum, as this would cause a dissolution of the aluminum under the influence of the saliva. This free space is later filled out with rubber, white rubber being most suitable for the top layers, as it harmonizes with the color of the aluminum. The gingival portion of the plate need not be carved quite so carefully, as after roughening it is covered with pink rubber. After casting, the flask must be allowed to cool slowly in order to avoid checking of the teeth.

Cast aluminum plates have the advantage of lightness, non-breakability, small amount of rubber, and especially strong adhesion even in very small mouths with flat palates.

[*Bulletin du Syndicat des Chirurgiens-Dentistes de France*, Paris, September 1910.]

NEW METHOD OF REPAIRING BRIDGES. By Dr. T. L. Larseneur.

If a tooth in a bridge has been fractured, the fragments are removed from the backing,

and the pins of the fractured tooth are ground away level with the gold backing of the bridge. A suitable Steele's porcelain facing is then selected and ground to perfect fit. After drying the backing, a very small quantity of wax is dropped on it with a hot spatula, and the facing, after having been dipped in water, is pressed to place with the finger. The facing is then immediately removed by a sliding motion, the wax remaining on the backing, which is of chief importance for the success of the repair. This wax shows a reproduction of the groove in the facing and indicates the exact position of the tooth on the bridge. With a bur one hole is drilled into the facing just above the lower end of the elevation in the wax, and another hole at about the middle of the backing. The wax is then removed, and a drop of oil is deposited in the two holes. These holes are then suitably deepened, and threaded carefully. Small suitable screws are fastened in the holes tightly and the facing is tried and cemented into place. The heads of the screws engaging in the undercut slot of the Steele facing serve to firmly hold the facing when cemented to place.

[*Correspondenz-blatt fuer Zahnaerzte*, Berlin, July 1910.]

THE QUESTION OF THE PRESERVATION OF THE TEETH IN OSTEOMYELITIS OF THE JAWS. By Dr. A. Stein, Koenigsberg.

Arriving at his deductions from the treatment of several practical cases described in his article, the author answers the question of the preservation of the teeth in osteomyelitis of the jaws in the following way: The teeth involved are to be extracted in osteomyelitis of the jaw, first, if it is to be supposed that the teeth stand in causal relationship with the osteomyelitic process, and the success of conservative treatment seems doubtful; and second, if the teeth during the progress of the disease exhibit no tendency to become firm again.

The teeth are to be preserved, first, in diffuse and circumscribed osteomyelitis when they stand in no causal relationship with the disease; second, if it can be ascertained that the osteomyelitic process has not yet destroyed the dental pulps by granulations and suppurative absorption of the apices of the roots, causing necrosis of the pulp, the induced current and the skiograph should be employed to determine the status of the disease.

[*Revue Générale de l'Art Dentaire*, Paris, June 1910.]

SPONTANEOUS DEATH OF THE PULP WITHOUT CARIES, DUE TO GRIPPE. By Ch. Richaume.

The causes of spontaneous death of the pulp without caries are sometimes obscure. Traumatism either from a direct blow, as most generally noted in front teeth, or from concussion of the molars following the biting on some hard particle in the food, is the most frequent and important causal factor. The tooth is driven into the alveolus and the nerve fiber of the pulp is crushed, involving the death of the organ. Habitual grinding of the teeth, wearing away by usage, and sudden changes in temperature, sometimes produce this lesion. Such cases are not difficult to diagnose, as the history furnished by the patient is generally clear. This is not the case, however, if the lesion is produced by infection from some disease which does not produce any symptoms on the buccal mucosa. Grippe, especially, may affect the dental organs without manifesting itself in gingivitis. The author reports a case of a young woman of twenty-one years of age, who one year following an attack of grippe exhibited slight grayish discoloration of the upper left central incisor, which three years afterward was followed by a severe inflammation of the entire left side of the face, abscess with profuse suppuration, looseness and elongation of the tooth, and general fever. The pain was extremely intense. The tooth was carefully opened, a reddish and very fetid pus flowing from the pulp chamber. Frequent rinsing with a three per cent. chloral hydrate solution was first prescribed. The following day, the pus having drained out and the tooth being less sensitive, the root-canal was disinfected with sulfuric acid and zinc peroxid. This was repeated until the dressing was absolutely clean and free from odor, the canal was flooded with iodoform and ether, and the tooth filled with gutta-percha. As the gingival tissue was still inflamed, it was painted with the following mixture: Tinc-

ture of iodin, tincture of arnica, spirit of cochlearia, alcoholic tincture of aconite, laudanum, equal parts of each. In addition frequent rinsing with tepid boiled water was prescribed. This was continued for a week, when the temporary filling was removed, the canal disinfected again, and washed with chloroform, dried with hot air, filled, and the tooth definitively filled. No further untoward symptoms developed, and the tooth has been normally serviceable ever since.

The lesson to be derived from this case is that whenever after an atack of grippe discoloration of a tooth is noted, it should be opened and treated immediately, in order to save the patient much consequent trouble.

PERISCOPE.

Treatment of Cocain Poisoning.—Ether is administered by inhalation, yet only to the degree of mild surgical narcosis or even less. A mask is employed, and the anesthetic given by the drop method.—*Monthly Cyclopedia and Medical Bulletin.*

Pigmentation of the Buccal Mucosa in Anemia.—Five cases have so far been reported in which there was well-marked pigmentation of the mucous membrane of the mouth in pernicious anemia.—T. G. Moorhead, *Brit. Med. Journal*, per *Journ. of the Amer. Med. Association.*

To Remove Silver Nitrate Stains.—Silver nitrate stains can be removed from the hands or from towels with tincture of iodin. After the iodin has been allowed to act for a few moments, the spots are touched up with ammonia water, and the stains disappear.—Coebergh, *Tijdschrift voor Tandheelkunde.*

Preventing the Rubber Dam Holder from Marking the Patient's Face.—By slipping a card between each side of the rubber dam holder and the cheek, after the holder has been adjusted, the holder can be prevented from marking the cheeks of the patient. This is particularly desirable during long operations.—E. E. Haverstick, *Dental Summary.*

Collapse from Hemorrhage.—In collapse from hemorrhage suprarenin or adrenalin is given very slowly by the intravenous method. 5 minims of a 1:1000 solution in a pint of warm saline solution (105° F.) are used. In urgent cases, 10 drops may be given in 1 dram of saline solution and repeated at intervals until the heart responds. Artificial respiration hastens the effect of this treatment.—*Monthly Cyclopedia and Medical Bulletin.*

A Precaution in Inserting Temporary Stopping.—After treating a tooth, it is well to pass a smooth broach through the stopping while it is still warm, to relieve possible air-pressure in the pulp-chamber owing to the pressing of the temporary stopping to place. This is particularly important in treating a tooth from which a putrescent pulp has been removed, or one which has an acute alveolar abscess. After a few seconds the opening made by the broach may be closed by a warm instrument.—E. E. Haverstick, *Dental Summary.*

Simultaneous Use of Expansion Arch and Clamp Bands in Regulating Teeth.—In applying an expansion arch with clamp bands on the anchor teeth, the bands and arch should all be applied together, not first one band and then the other and then the arch. It is hardly possible to properly "line up" the buccal tubes on the bands to receive the expansion arch except by applying the bands with the arch in position within those tubes. This is both the best and easiest way, and should be followed with any make of arch and bands. Wm. J. Brady, *Western Dental Journal.*

Quinin and Urea Hydrochlorate as a Local Anesthetic.—Dr. F. E. Neres reports that he uses quinin and urea hydrochlorate for tonsillotomies and all operations about the nose with good results. The nicest thing about quinin and urea hydrochlorate as a local anesthetic is that there is no toxic effect. It can be used *ad libitum*, the anesthesia lasting from two to four hours. It can be used as strong as in a two per cent. solution, but a one-fourth of one per cent. produces perfect anesthesia and does not produce edema of the tissues, where a two per cent. solution may produce some edema and prevent union by first intention.—*Denver Medical Times*, per *Drug Topics.*

A Short Cut in Rubber Repairs.—When red rubber has run through the pink in the process of vulcanizing, cut out the red spot, leaving the margins at right angles and the bottom of the cavity larger than the top. Then take a piece of pink rubber from an old plate of the same shade, and trim a plug so as to nearly fill the cavity. Take the plug in a pair of pliers, hold it over a flame (do not burn) and when it softens press it to place, holding it firmly until it cools. Trim off and polish and, if the work is neatly done, you cannot find the repaired spot.—M. B. Yeoman, *Dental Summary.*

Asymmetry of the Hard Palate.—In the faulty eruption of the posterior teeth, as well as of the anterior, and in their faulty occlusion, we have the explanation of fully half of the cases of asymmetry of the hard palate. Another cause is trauma. The practical lesson then is: Avoid trauma, which we do instinctively, and look after the proper eruption and spacing of the teeth. In the past, pardonable vanity and toothache have brought the patients to the dentist. In the future there should be a more scientific reason, namely, the attempt to avoid the harmful effect of poorly erupted and placed teeth on the septum and on nasal respiration.—H. P. Mosher, *Laryngoscope,* per *Journ. of the Amer. Med. Association.*

Influence of Cement upon the Color of a Porcelain Inlay.—A change in color is often noticeable when an inlay is cemented into place. The inlay may be a good match when the incidence of light is at such an angle as will permit its transmission. But when the angle of incidence is changed, some portion of the inlay may appear to be of different color, caused by the formation of a shade. In this phenomenon the cement is the chief factor. If it were transparent, it would not prevent the passage of light through the tooth. If light penetrates a short distance into a body and is then reflected, the surface generally appears to have the color of the reflected rays. But since light is not transmitted by an opaque substance, the rays are either reflected or absorbed. Whenever light is incident upon an inlay, it is excluded from the dentin on account of the layer of cement, which forms an opaque body, and the color of that portion of the tooth and inlay which is in contact with the cement may differ from the other parts because of the unequal absorption and reflection of the rays.—J. Q. Byram, *Pacific Dental Gazette.*

Gold Crown for Bridge Abutment on a Sensitive Tooth.—After preparing the circumference of the tooth, shorten it as much as possible. Fit a gold band, extending from the lowest cervical border to the highest cuspal border. Properly contour it, and get accurate occlusion of this band with the opposite tooth in the mouth. With the band in position, fit a thin platinum disk inside of the band and upon the grinding surface of the tooth. Secure it in position with hard wax. Remove carefully, and invest in some suitable compound, leaving the wax exposed. When the investing material has set, remove the wax and place bits of sponge gold in any cracks. Then place narrow strips of 20-k. gold solder around the band, resting just inside, and flow them with the blowpipe; a sufficient quantity will flow in the center. This crown will go back in position without further grinding of the tooth, and should there be too much solder at any point it can be ground out. The dummies can be soldered to this with 18-k. gold solder, without disturbing the crown. This method can be used in opening the bite, and is also especially indicated when the tooth has been worn down irregularly, a condition often found in the mouths of tobacco chewers.—L. P. Dotterer, *Dental Brief.*

Maxillary Sinusitis.—The most characteristic symptom of this disease is a discharge of pus from the nostril on the affected side. Other symptoms which may be found, and which are more or less marked in each individual case, are swelling and bulging of the thin walls of the sinus and pain and soreness in the region under the eye and outside the nose, which is intensified or lessened as the head is held in different positions. The patient may also be conscious of fluid in the cavity as the head is moved about or have a sense of fulness and uneasiness in the cheek region. Other symptoms to be looked for are a crackling sensation under pressure and a dusky color of the skin.

The most common dental causes are abscessed teeth and roots covered by the gum. Other prominent factors are foreign bodies, such as a broken broach, gutta-percha cone, or cotton dressing protruding through the roots of a tooth into the antrum, imperfect root-fillings, and roots of teeth forced into the sinus during extraction and not recovered. Other causal agents may be necrosis of bone of either syphilitic, tuberculous, traumatic, or chemical origin, benign and malignant growths or dentigerous cysts.

In making a diagnosis, much depends on a very careful and thorough examination of

the teeth, for a cessation of all symptoms has been known to follow the removal of a tooth alone. In all cases radiography and transillumination should be made use of. With maxillary sinusitis present, we should not confound sympathetic pain localized in any of the adjacent teeth, that we may not err in unnecessary extraction. While trouble with both antra is fortunately very rare, we should also not overlook the fact that it may occur.

Necrotic conditions, to which empyema of the maxillary sinus is usually secondary, are determined by the history, probe, characteristic foul odor, and pus. Differentiation between benign and malignant growths is made by means of the history, the age, and microscopic examination.

With sound teeth on the affected side, the radiograph and transillumination showing negatively, and neither necrosis nor growths present, it is fair to suppose that maxillary sinusitis is due to or associated with disease of the accessory air-sinuses, the treatment of which lies not within the field of the dental surgeon.—Albert L. Midgley, *Items of Interest.*

Simple Device for Preventing the Contamination of Sterile Solutions.—Sterile solutions are often put into carefully sterilized bottles, closed with sterile stoppers, and then set aside. By the time the solutions are to be used dust has collected on the lips of the bottles, and in pouring out the contents the germs are washed off, and the solutions are no longer sterile. Wiping the top of the bottle at best removes only part of the germs, and drops the rest of them directly into the bottle. Then the stopper is laid down on some unsterile surface and, loaded with micro-organisms, is returned to the bottle.

To obviate this, a round piece is cut from heavy rubber sheeting—that from a hot-water bottle answering best—this piece to be of such size that when it is placed over the mouth of the bottle, the edges project somewhat. Then a small round hole is cut in the center, of such size that the rubber is with some difficulty slipped over the stopper. When the stopper is then returned to the bottle, the rubber covers the lip and extends a little beyond, thereby keeping off all dust. Evaporation of the bottle's contents is also prevented.

Another advantage is that the stopper may be laid down without the inner end resting on the unsterile table, as the rubber acts much the same as the rest on a carving-knife. —A. G. Bettman, *Journ. of the Amer. Med. Association.*

A Gold Shell Bicuspid Crown with Steele Facing.—Construct the shell crown in any manner you desire. Before reinforcing the cusps with solder, cut out enough of the buccal surface of the crown to allow the facing and its backing to be set into the cavity thus made and to fill out the contour of the crown as it was before cutting away the gold. In cutting, use a knife-edge stone and begin at about the middle of the buccal cusp and proceed toward the gingival, to about the gum line, then cut along the gum line from the outer surface inward to meet the line already cut.

To the gingival edge of the backing solder a small piece of pure gold, and burnish this over the gingival face of the facing, as in constructing a Richmond crown. Place the facing together with its backing in the space cut into the crown, and after adjusting and fitting properly, remove the facing and solder the backing in place as you would a cusp. No investment is necessary in soldering.—J. S. McDonald, *Dental Summary.*

The Faradic Current in Dental Diagnosis.—A tooth may appear to be in a normal and healthy state, and it may respond or not to thermal change and other tests, and yet the pulp may be dead. The faradic current will give positive and instant results, and will show whether the pulp is living or dead. The equipment necessary is any style of faradic battery, connecting cords, a hand electrode, and a broach-holder that is thoroughly insulated from the hand of the operator.

Wrap a few fibers of cotton on the broach, place the hand electrode in one of the patient's hands, wet the cotton on the broach, thoroughly dry the tooth to be tested, then apply the point of the broach, holding wet cotton to the tooth at a point nearest to the pulp, being careful to not allow the electrode to come in contact with the soft tissue of the mouth, which would cause a disagreeable shock to the patient. If there is a metal filling in the tooth to be tested, and it is not in contact with the adjoining tooth or touching the gum tissue, or can be thoroughly insulated from both by the use of mica or rubber dam, the test can be made through the filling, it being in contact with the dentin and being a better conductor than the enamel of the tooth, which is a very poor conductor of electricity. On applying the faradic current, if the pulp is alive, a slight shock will result, but if the pulp is dead there will be no response to the current.—J. C. Parr, *Dental Summary.*

Grinding Gum Sections.—Gum teeth have decided advantages over plain teeth in cases where the patient, either because of the shortness of the upper lip or through habit, exposes the gum to any considerable extent in speaking or laughing. Porcelain excels anything else ever used in its capacity of imitating gum tissue. Gum color can be exactly reproduced, and the resemblance is intensified when the porcelain gum is moistened with the saliva of the mouth, which gives it a flesh-like texture difficult to distinguish from the natural gum. This is one of the great advantages that the gum teeth have over the plain teeth. There is no pink rubber that will not fade and look nasty in a few years. In a case of short upper lip, and showing of the alveolar process, if plain teeth are used with pink rubber, every time the patient laughs, of course, the pink rubber shows, and in a few years the rubber will fade, and the set of teeth becomes unsightly. We see them every day, and we shall continue to see them unless this "lost art" is again taught in our dental colleges.—J. O. Hawkins, *Dental Summary.*

Corrosion of Steel Caused by Paper.—It is not uncommon that corrosion and oxidation of bright steel objects is caused by the presence of injurious substances in paper. This may be due either to free acids or chlorin compounds or, more frequently, especially in the case of hard-sized paper, to the excessive use of aluminum sulfate, which is gradually dissociated by atmospheric influences. Another drawback associated with certain kinds of paper is the blackening—due to the formation of sulfid—which they produce on articles of silver or copper. Owing to the growing use of paper from wood pulp prepared by digestion with sulfur compounds, this blackening action is more prevalent now than it was formerly. In fact, it is asserted by Herr Klemm, in a recent investigation of this subject, that most, if not all, unbleached wood pulps of the sulfite and sulfate class contain traces of sulfur compounds that have a blackening action upon silver or copper; and that even bleached pulps may contain minute quantities of similar substances. Unbleached pulps prepared by the caustic soda process and mechanical wood pulps, however, are generally free from these sulfur compounds.—*Scientific American*, per *Drug Topics.*

Phenol as a Dental Disinfectant and Mouth-wash.—Phenol meets many of the requisites for the ideal mouth-wash. In appropriate strength, while far from being absolutely innocuous, it is not too highly poisonous to be used as the basis of a mouth-wash, nor does it appear to exercise a markedly deleterious influence upon mucous membrane. Its taste is not intensely unpleasant, suggesting very strongly that of its mother, coal tar. It has, however, a paralytic action upon the peripheral nerve endings, and leaves behind in the mouth a peculiar sensation of numbness which to some persons is disagreeable and may interfere with its utility. The disinfectant power of phenol, at least for the non-sporulating micro-organisms, is very considerable. Thus Sternberg found that after two hours' exposure a ½ per cent. solution was sufficient to destroy typhoid bacilli and an 0.8 per cent. solution to kill micro-organisms of suppuration. Weeks found that a solution of one part in sixty destroyed the staphylococcus pyogenes aureus in four minutes, while Perroncito found that a 1 per cent. solution would destroy anthrax bacilli free from spores in seven minutes.—H. C. Wood, *Pacific Dental Gazette.*

OBITUARY.

DR. JOSEPH P. GRAY.

Died, at his home, Nashville, Tenn., September 30, 1910, Joseph P. Gray, D.D.S., in his fifty-sixth year, of paralysis.

Dr. Gray was born in Windsor, Mo., on January 1855, as the son of a prominent farmer. At an early age he showed an inclination toward the medical profession, and began the practice of dentistry at the age of eighteen in Clinton, Mo. In 1879 he moved to Sedalia, Mo., where he married Miss Cora Gorth of that place. In the spring of 1890 he went to Nashville, Tenn., having been chosen dean of the Dental Department of the

University of Tennessee, in which capacity he officiated for many years.

Dr. Gray's eminent success and profound knowledge in his chosen field brought about his election to the secretary's office of the Vanderbilt University, Dental Department, in 1905, which position he occupied at the time of his death. In this capacity Dr. Gray exhibited remarkable executive ability, bringing about great changes for improvement in the department under his charge. Among the students he was greatly respected and honored, and always took a fatherly interest in their welfare. In 1896 he was elected president of the National Association of Dental Faculties, one of the highest honors to be bestowed on a member of the profession. He had been actively interested in the affairs of this association for many years, and was chairman of the *ad interim* committee at the time of his demise.

Dr. Gray enjoyed great popularity in society. He was a prominent member of the Presbyterian church, and took an active part in its social work.

Throughout the long period of his active work in the interest of his profession Dr. Gray won hosts of friends by the uniform kindness which characterized his attitude toward all men. Cheerful and sympathetic, always ready to serve those in need of his help, a consistent defender of the right and a champion of those who were the victims of any injustice, he filled a place in the hearts of his colleagues and of those near him which was as deep as it was unusual. Dr. Gray was an accomplished teacher, and one who not only gave his best effort to the work of instruction, but his ability as an organizer and his wisdom as an administrative officer made his influence an important and lasting one in our educational councils. The qualities of probity, of fairness, of subordination of personal interests to the larger demands of the general good, were elements of his character that especially distinguished him—elements none too common and the very rarity of which make the demise of their possessor a real loss to any community or to any cause affecting the interests of humanity. It is just such a loss that dentistry has sustained in the death of Dr. Gray. A sincere and deep sorrow will be felt by all who knew him because of the sudden ending of his useful life and the loss of his lovable personality.

Dr. Gray is survived by the wife of his second marriage, Mrs. Ella Duncan Gray, and their three children, two daughters and a son. Interment was made at Windsor, Mo.

DR. E. D. BROWER.

Died, October 10, 1910, at Le Mars, Iowa, E. D. Brower, D.D.S., from paralysis, in his sixty-third year.

Dr. E. D. Brower, secretary of the Iowa State Board of Dental Examiners, was born in Leesville, Carroll County, Ohio, January 15, 1858. He began the study of dentistry in 1878, with Dr. J. K. Morrison, at Ackley, Iowa, and the following year entered the dental school of Ann Arbor, from which he was graduated in 1881. He immediately began the practice of dentistry in Le Mars, continuing there until the time of his death.

He was a man of no mean ability and always enjoyed a place in the company of those who were "doing things" in dentistry in Iowa. He was a genial, warm-hearted friend, a man who had the interests of the profession very much upon his heart, and who helped in the making of history in his state. He will be greatly missed in state and local societies, as well as from the Board of Dental Examiners.

Dr. Brower suffered a stroke of paralysis, April 17th, from which he never recovered. Death came on Monday, October 10th, releasing him from bondage to a disease that would doubtless have kept him a cripple to the end of life, no matter how prolonged that end might have been. Our sympathy is extended to the wife and daughter, who remain to mourn the passing of a life cut off in its very prime.

——— T. F. C.

The Iowa State Board of Dental Examiners passed the following resolutions of regret in reference to the loss sustained in the death of their esteemed colleague:

Whereas, it is with sincere regret that we, the Board of Dental Examiners of the State of Iowa, must chronicle the passing of Dr. E. D. Brower, who has been our efficient secretary for so many years, and

Whereas, it is our firm conviction that in the death of Dr. Brower the Board of Dental Examiners has lost a faithful and efficient secretary, and the dental profession of Iowa a valued and tireless worker for its advancement; therefore be it

RESOLVED, That we do hereby express our personal loss at his removal from our circle, and in this manner convey to the profession at large our appreciation of his services in the interest of higher dentistry; and to his bereaved wife and daughter, our sincere sympathy in their hour of sorrow.

(Signed) F. H. RULE,
J. A. WEST,
G. N. BEEMER,
T. F. COOKE.

DR. LUCY B. TAYLOR.

DIED, at her home, Lawrence, Kans., on October 3, 1910, LUCY B. TAYLOR, D.D.S., in her seventy-eighth year, of progressive paralysis.

The first woman in America to be graduated from a dental college has passed away in the demise of Dr. Lucy Taylor. While many women have since entered the profession, she was the pioneer to embark in a profession which in those days was considered an exclusive field for men.

Lucy B. Hobbs was born at Ellenburg, Clinton, N. Y., on March 14, 1833. At nine years of age, when other children are scarcely emerging from the primary grades, she was thrown upon her own resources. She struggled along, getting what scanty education she could, until a friend finally assisted her in entering the Cincinnati Dental College, where in spite of great handicaps she was graduated with honors. A sketch recounting her trying experiences in securing this diploma was read before the World's Fair Dental Congress, exciting such vivid interest and being of such great value for the history of the dental profession in America that it is kept on file with the State Historical Society in Topeka.

Dr. Hobbs started to practice dentistry in Iowa, then moved to Chicago, where success greeted her efforts. Here she was betrothed to James M. Taylor, who was a civil-war veteran, and whom she married on April 24, 1867. In the same year the couple moved to Lawrence, Kans., where Dr. Taylor continued her practice, even after the demise of her husband in 1886.

Dr. Taylor was a woman of great mental force, and until she became physically unable, was an active member of several patriotic orders. Interment was made in the Oak Hill Cemetery.

Brief Necrology.

Dr. GEORGE R. MAJOR of Bellevue, Ky., September 23, 1910, after prolonged illness.

Dr. WALTER W. WILSON of Chattanooga, Tenn., September 16, 1910, after prolonged illness.

Dr. J. C. WHINNERY, contract dental surgeon, U. S. Army, at Zamboanga, Mindanao, P. I., on July 29th.

Dr. A. J. BRADFORD of Cincinnati, Ohio, September 30, 1910, from an over-dose of potassium chlorid, taken for a stye.

Dr. FRANCIS MARION REYNOLDS of Oak Bark, Chicago, Ill., September 29, 1910, in his eighty-first year, in a train accident.

Dr. EUGENE J. PERDEW of Keokuk, Iowa, September 1, 1910, in his sixty-sixth year, after a prolonged illness. Deceased was a veteran of the civil war.

Dr. CLAUDE ARTHUR GRENACHE of East Pepperell, Mass., September 7, 1910, in his thirty-eighth year, in an automobile accident. Deceased was graduated from the Pennsylvania Dental College in 1898.

Dr. CHAS. LOUIS DUBAR of East Orange, N. J., September 17, 1910, in his fifty-ninth year. Deceased was graduated from the New York Dental College in 1875, and for years was dental surgeon to the East Orange French Hospital.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL INDEX BUREAU

UNDER THE AUSPICES OF THE

NATIONAL ASSOCIATION OF DENTAL PEDAGOGICS.

ANNOUNCEMENT

Of special interest to Students, Writers, Publishers, Editors, Librarians, Colleges, Dental Societies, etc.

THE Executive Committee of the Dental Index Bureau is pleased to announce the plans adopted for the classification and distribution to subscribers of an index of current dental literature.

* * * * *

PLAN OF INDEXING AND CLASSIFYING ARTICLES.

This index will be published in two parts, one being an author index, the other a subject index. The author index will contain all of the writings, biographical sketches and important personal notices, arranged alphabetically according to the author's names; all of the writings of each author together. The subject index will contain all original articles, papers read before societies, editorials, book reviews, important selected articles and abstracts, arranged according to subjects, and the subjects themselves will be so classified and arranged that related subjects will be grouped. All of the writings on each subject will be together. There will also be included in this subject index all of the small items generally known as "practical hints," for as many journals as the funds of the Bureau will permit. It is believed that these items may be indexed for most, if not all, of the journals.

ARTICLES IN EACH JOURNAL SEPARATE.

An important feature in the arrangement of the index will be the grouping of the items under each particular subject in accordance with the journals. For example, for the subject of gold inlays, all of the articles in the DENTAL COSMOS will be together, all of those in the *Dental Review* together, and so for each other journal. It will therefore be possible for one to find quickly all of the articles, on any subjects, appearing in those journals which he has in his library, or in any single journal, without looking over the lists for other journals.

PLAN FOR PUBLICATION AND DISTRIBUTION.

The index will be printed in book form and will be distributed to subscribers annually, as soon after January 1st as is practicable. Work is now in progress on the 1909 journals and will be published as soon as completed. The development of definite plans has materially delayed the work for this year.

The type metal from which the annual index is printed will be kept standing and at the end of each fifth year the five yearly indexes will be combined and published as a single volume. In publishing this volume, the items for each journal under each subject heading will be grouped together, so that for each subject, the articles which have appeared in each journal will be in their proper chronological order. This will give every fifth year, in a single volume, a complete index classified by authors, by subjects, and by journals under each subject, for all of the dental journal literature of the preceding five years.

The committee has considered carefully all other plans of supplying this index to the subscribers to the Bureau, and believes this plan to have many advantages over all others. It will be the most convenient to us and will occupy little space. A card system would for this purpose be too expensive and too bulky, in addition to the danger of loss of items by the removal of cards.

COST TO SUBSCRIBERS.

The plans of the Bureau have been developed on the basis of one hundred subscribers at $25.00 each per year—$2500.00. It is believed that when the work has been properly systematized it will be possible to do the indexing of two years for that amount, and it is the intention to use surplus funds to index the literature previous to 1909.

COST PER SUBSCRIBER CAN BE MUCH REDUCED.

The committee has in hand or in sight about seventy-five subscriptions for 1909, 1910 and 1911, and anticipates no difficulty in se-

curing the full one hundred at $25.00 each. Particular attention is called to the fact that two hundred, or three hundred, or five hundred copies of the index can be published at very slight additional expense and it will therefore be possible to materially reduce the cost per subscriber by securing additional subscriptions. If the index for the journals mentioned can be furnished to one hundred at $25.00 each, practically the same index can be furnished to two hundred at $12.50 each, or to five hundred at $5.00 each. All subscriptions for the 1909 index will be received with the understanding that any surplus which may accumulate on account of the number of subscribers exceeding one hundred, will be pro rated and applied on the account of each subscriber for the following year.

* * * * *

WHO MAY SUBSCRIBE.

The officers of the Bureau will be pleased to receive subscriptions from individuals, societies, schools, journals or libraries. A group of dentists may together make up a single subscription and receive a copy of the index to be used by all; a society may subscribe and place a copy of the index in the hands of its secretary, who can supply members with information whenever they wish it, or may place the index in its dental library for the use of its members. It is hoped that enough subscriptions will be received to materially reduce the cost to each subscriber. Not more than $2500.00 will be spent by the Bureau in any year in indexing the literature of the current and past years, so that every subscription over one hundred which is received means a reduction in the cost to all subscribers, the extra amount to be credited on the next year. All subscribers are therefore urged to assist in obtaining additional subscribers.

All subscriptions should be sent to Dr. W. L. Fickes, Secretary-Treasurer, 6200 Penn Ave., Pittsburg, Pa.

Very respectfully submitted,

Dr. ARTHUR D. BLACK, *President*,
31 Washington st., Chicago, Ill.
Dr. ELLISON HILLYER, *Vice-president*,
1143 Dean st., Brooklyn, N. Y.
Dr. W. L. FICKES, *Sec'y-Treasurer*,
6200 Penn ave., Pittsburg, Pa.
Dr. SHIRLEY W. BOWLES,
826 Vermont ave., Washington, D. C.
Dr. G. W. GETHRO,
Marshall Field Building, Chicago, Ill.
Executive Committee.

ODONTOGRAPHIC SOCIETY OF WEST PHILADELPHIA.

THE Odontographic Society of West Philadelphia will hold its next meeting on Monday, November 7, 1910, at 8 P.M., in the Amphitheater of Dental Hall, University of Pennsylvania. Dr. P. B. McCullough will deliver a lecture on "The Present Status of Crown and Bridge Work."

R. R. PARKS, *Sec'y.*

UNIVERSITY OF CALIFORNIA, DENTAL DEPARTMENT.

ALUMNI ASSOCIATION.

THE annual meeting of the Alumni of the Dental Department of the University of Southern California, will be held about the third week in December. The entire day will be devoted to clinics and exhibits.

Preparations are now under way to make it a grand success. A large attendance is expected. All practitioners cordially invited.

Programs will be mailed in the near future.

C. J. R. ENGSTROM, *Sec'y-Treasurer.*

OHIO STATE DENTAL SOCIETY.

THE forty-fifth annual session of the Ohio State Dental Society will be held in Columbus on December 6, 7, and 8, 1910.

The Great Southern Hotel will be headquarters as heretofore, but additional space will be available, giving more room for the meetings of the society and the clinics.

Come and hear "A Symposium on the Physiology and Pathology of the Sockets and Gums," by men of wide reputation, viz:

Dr. M. H. Fletcher, the president, on "Reparative Powers of Cementum."

"Physiology and Anatomy of the Gums and Sockets," by an essayist yet to be secured.

Dr. T. B. Hartzell of Minneapolis, on "Infection and Pathology of the Gums and Sockets."

Dr. N. S. Hoff of Ann Arbor, on "Instrumentation and Medication of Gums and Sockets."

Dr. Joseph Head of Philadelphia, on "Prophylaxis of Gums and Sockets."

Dr. S. L. McCurdy of Pittsburg, on "Extended Diseases of the Sockets and Bones; Surgical Treatment."

Mark these dates on your appointment book now!

F. R. CHAPMAN, *Sec'y.*

SEVENTH AND EIGHTH DISTRICT (N. Y.) DENTAL SOCIETIES.

The annual union meeting of the Seventh and Eighth District Dental Societies of the State of New York will be held at Rochester, in the Hotel Seneca, on November 10, 11, and 12, 1910.

An especially good program has been prepared. All ethical dentists are invited to attend these meetings.

George C. Lowe, *Rec. Sec'y.*

SOUTHWESTERN NEBRASKA DENTAL SOCIETY.

The seventh semi-annual meeting of the Southwestern Nebraska Dental Society will be held at McCook, Nebr., Thursday, February 23, 1911.

W. A. McHenry, *Sec'y,*
Nelson, Nebr.

G. V. BLACK DENTAL CLUB.

Midwinter Clinic.

The G. V. Black Dental Club of St. Paul will hold a midwinter clinic in February, 1911. It it our intention to make this meeting the most interesting and profitable of all which we have held.

A cordial invitation is extended to the members of the profession to attend, and assist us in making this meeting the best that has ever been held in the Northwest. Dates and program will be published later.

For further information address

R. B. Wilson, *Sec'y,*
Am. Nat. Bank Bldg., St. Paul, Minn.

MARYLAND BOARD OF EXAMINERS.

The Maryland State Board of Dental Examiners will meet for examination of candidates for certificates November 10 and 11, 1910, at the Dental Department of the University of Maryland, Baltimore, at 9 A.M. Applications, accompanied by the fee of ten dollars, must be filed with the secretary prior to November 10th.

For further information address

F. F. Drew, *Sec'y,*
701 N. Howard st., Baltimore, Md.

MICHIGAN BOARD OF EXAMINERS.

The next regular meeting of the Michigan State Board of Dental Examiners will be held at Ann Arbor, Mich., November 16 to 19, 1910, inclusive.

A. W. Haidle, *Sec'y,*
Negaunee, Mich.

NEBRASKA BOARD OF EXAMINERS.

The next regular meeting of the Nebraska Dental Board for the examination of applicants for license to practice dentistry in Nebraska will be held in Lincoln, Nebr., at the State-house, beginning Monday, November 14, 1910, at 9 A.M. All applications must be in the hands of the secretary by November 7th. For application blanks and other information address

H. C. Brock, *Sec'y,*
North Platte, Nebr.

ILLINOIS BOARD OF EXAMINERS.

The semi-annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Illinois will be held at the University of Illinois, Dental Department, corner Harrison and Honore sts., beginning Monday, November 7, 1910, at 9 A.M.

The following preliminary qualifications are required to entitle to examination by this board for a license to practice in the state of Illinois: Graduates of a reputable dental or medical school or college, or dental department of a reputable university, who enter the school or college as freshmen on or after the school year 1906-7, must have a minimum preliminary education of not less than graduation from an accredited high school—or a certificate from the state superintendent of public instruction, equivalent officer or deputy acting within his proper or legal jurisdiction, showing that the applicant had an education equal to that obtained in an accredited high school; which certificate shall be accepted in lieu of a high-school diploma.

Candidates will be furnished with proper

blanks and such other information as is necessary on application to the secretary. All applications must be filed with the secretary five days prior to date of examination. The examination fee is twenty dollars, with an additional fee of five dollars for a license.

Address all communications to

T. A. BROADBENT, *Sec'y*,
705 Venetian Bldg., Chicago, Ill.

ARIZONA BOARD OF EXAMINERS.

THERE will be a meeting of the Arizona Board of Dental Examiners, November 14th to 18th, at Phœnix, Arizona. Candidates should make their application, and fee of twenty-five dollars should accompany same, at least twenty days before meeting.

The theoretical examination includes the following subjects: Anatomy, physiology, chemistry, materia media, therapeutics, metallurgy, histology, pathology, operative and mechanical dentistry, oral surgery. Practical demonstration of skill in operative and mechanical dentistry will also be required, and candidates should come prepared with instruments and material for making fillings and crowns in the mouth.

W. A. BAKER, *Sec'y*,
Tucson, Ariz.

MINNESOTA BOARD OF EXAMINERS.

THE next regular meeting of the Minnesota State Board of Dental Examiners will be held at the Dental Department of the State University of Minneapolis, on November 15, 16, and 17, 1910.

All applications must be in the hands of the secretary ten days previously. All applicants must be graduates and present their diploma. Those having practiced in any of the following states for five years or more will be exempt from the theoretical examination: Iowa, Indiana, Michigan, Nebraska, Wisconsin, and Montana. Minnesota dentists are admitted to those states on same conditions.

For blanks and further information apply to

GEO. S. TODD, *Sec'y*,
Lake City, Minn.

CONNECTICUT DENTAL COMMISSIONERS.

THE Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Wednesday, Thursday, and Friday, November 16, 17, and 18, 1910, to examine applicants for license to practice dentistry, and for the transaction of any other business proper to come before them. Application blanks, rules, etc., will be forwarded by the recorder upon request.

By order of the Commission.

GILBERT M. GRISWOLD, *Recorder*,
783 Main st., Hartford, Conn.

PENNSYLVANIA BOARD OF EXAMINERS.

THE next regular meeting of the Pennsylvania Board of Dental Examiners will be held on December 14, 15, 16, and 17, 1910, at the Hotel Stenton, Philadelphia, and in Pittsburg Dental College, Pittsburg.

For further information address the Department of Public Instruction, Harrisburg, or

ALEXANDER H. REYNOLDS, *Sec'y*,
4630 Chester ave., Philadelphia.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE next meeting of the New Hampshire Board of Registration in Dentistry will be held from November 30 to December 2, 1910, at Masonic Banquet Hall, Manchester, N. H.

All persons desiring to practice dentistry are required to take an examination and become registered before beginning practice.

A. J. SAWYER, *Sec'y*,
Manchester, N. H.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their annual meeting in the Assembly chamber of the State-house, Trenton, N. J., December 5, 6, and 7, 1910. All applications must be in the hands of the secretary ten days prior to the meeting.

For information apply to

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

RHODE ISLAND BOARD OF REGISTRATION.

The Rhode Island Board of Registration in Dentistry will meet for the examination of candidates at the State-house, Providence, R. I., Wednesday, Thursday, Friday, December 28, 29, and 30, 1910. Application blanks and particulars may be obtained from

H. L. Grant, *Sec'y*,
1025 Banigan Bldg., Providence, R. I.

UTAH BOARD OF EXAMINERS.

The regular meeting of the Utah State Dental Board will be held in Salt Lake City, on December 6 and 7, 1910.

All persons desiring to secure licenses should address the secretary and procure applications. Applications must be returned to the secretary, with the fee of twenty-five dollars, not later than December 1st.

For further information address

A. C. Wherry, *Sec'y*,
Salt Lake City.

ARMY DENTAL CORPS.

Memorandum of changes of stations and duties of dental surgeons, U. S. Army, for the week ending September 24, 1910:

Charles J. Long, September 16th, left Madison Barracks, N. Y., on two months' leave of absence.

John S. Marshall, examining and supervising dental surgeon, September 16th, ordered to Columbus Barracks, Ohio, for duty.

Harold O. Scott, September 16th, relieved from duty at Columbus Barracks, Ohio, and ordered to Fort Hamilton, N. Y., for duty.

C. E. Lauderdale, September 17th, left Fort Logan, Colo., on ten days' leave of absence.

For the week ending October 1st:

John S. Marshall, examining and supervising dental surgeon, September 20th, reports on three months' leave of absence.

S. H. Leslie, September 23d, ordered to proceed from Fort Leavenworth, Kans., to Fort Meade, S. D., Robinson, Nebr., and Fort Mackenzie, Wyo., for temporary duty.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING SEPTEMBER 1910.

September 6.

No. 969,639, to Leopold Laugh. Toothbrush.

No. 969,682, to Horace M. Yorke. Dentists' implement.

September 13.

No. 969,922, to Wm. D. Tracy. Dental appliance.

No. 969,986, to Farris S. Sawaya. Apparatus for making backings for artificial teeth.

No. 970,148, to Henry E. Weber. Cuspidor.

No. 970,224, to Hermann Hoelzer. Toothpowder distributor.

September 27.

No. 971,274, to Fernando O. Jaques. Means for forming tooth crowns.

No. 971,382, to John L. Kelly. Dental instrument.

THE

DENTAL COSMOS.

VOL. LII. DECEMBER 1910. No. 12.

ORIGINAL COMMUNICATIONS.

THE PROGRESS OF DENTAL SCIENCE AND ART.

By N. S. JENKINS, D.D.S., Dresden, Germany.

(Read before the Dental Society of the State of New York, at Albany, May 6, 1910.)

IT is not my purpose to review the progress of dentistry from the earliest ages. That has already been ably done before the Odontological Section of the British Royal Society of Medicine by Ashley Densham; before the Chicago Odontographic Society by Charles McManus; and above all, through the publication of the first volume of the monumental work of Guerini. Through his scholarly labors we now know how the progress of dentistry has been illuminated, since the earliest dawn of history, by a succession of men great in the learning of their age. "Their distant footsteps echo down the corridors of time," and teach us anew the lesson of the continuity of mind throughout the ages.

Under every form of civilization, Egyptian, Assyrian, Hebrew, Mongolian, Greek, Etruscan, Phœnician, Roman, Arabian, mankind has been moved by the same ambitions, hampered by the same superstitions, stained by the same crimes, ennobled by the same virtues, suffered under the same penalties for the violation of natural law, contended with the same spiritual and physical problems, and has also been exalted by the same hopes and cast down by the same despair. Who of all the greater brothers of our race has seen his work completed? Who has not beaten impotently against the limit of time allotted to man, and cried with Omar—

When you and I behind the veil are passed,
Oh, but the long, long time the world shall last!—
Which of our coming and departure heeds
As much as Ocean of a pebble cast!

ANCESTORS OF DENTISTRY.

Yet, even as in the material world nothing is lost, although consumed by fire, but, changed in form, is still preserved to serve some other and perchance some nobler purpose, so with the intellectual life of man. Creeds and civilizations may rise and fall, but the triumphs of the mind, even though destroyed like the library at Alexandria, endure somewhere in various mysterious ways, and finally experience a renaissance in a new soil and under more favorable conditions

for the welfare and enlightenment of mankind. Just as the Greek sound of the consonant digraph *th* has escaped all the intervening Latin tongues, to reappear in our English speech, so from the efforts to combat dental disease made so many thousand years ago in distant lands, and so marvelously preserved for us in the Ebers papyrus, or the legends of Æsculapius, or the records which Hippocrates and Aristotle have handed down to us, or the long-forgotten prosthesis of the Etruscans and the Romans revealed to our wondering eyes in these modern days, or from the short period in which the Arabians enjoyed the possession of intellectual and martial supremacy and taught Europe both medicine and chivalry, may have come down the thoughts and impulses which have given birth to modern dentistry.

For it is rather the progress of the science and art of our own times of which I wish to speak—a progress which is comprised within the limits of the last seventy years, a time more momentous in the history of medicine than all the ages that have gone before.

THE DEVELOPMENT OF AMERICAN DENTISTRY.

Modern dentistry, like popular government, was appropriately born in America. It behooves us, however, to remember that, great as was the achievement of our ancestors in establishing upon this continent a government deriving its just powers only from the consent of the governed, they were already in the possession of the traditions of a thousand years of English struggles for liberty, without which inheritance it is inconceivable that, even with such great opportunities, they could have built so well. So in the birth of modern dentistry at Baltimore. It was from English and French sources that the first rudiments of dentistry in America were immediately derived. But, like American political institutions, this was seed sown upon good soil.

For untold ages mankind had waited for the hour when human life should be completely emancipated from blind superstition and servile subjection to hereditary personal power, under conditions where man might continue to be "man and master of his fate." It came at last not with the clash of arms in all "the pomp and pride and circumstance of glorious war," but in that movement in the early part of the seventeenth century when our adventurous ancestors left behind them the only civilization they knew, and sought, in various settlements upon the shores of this then inhospitable continent, to found a new state consecrated to personal liberty. It was through their breaking away from tradition, through their invincible courage and fortitude and their belief in the possibility of achieving their ideal that they were able to hand down to their successors such a splendid heritage, material and spiritual; and there is to this day no department of American activity which does not reflect and is not inspired by their influence.

Especially has this been evident in the development of American dentistry. From the first settlement of this country, its residents have been obliged to use both their hands and their brains. It has been perhaps the only country in which idleness and helplessness have always been a disgrace. To tame this mighty continent and subdue it to the use of man a new civilization had to be evolved and a race of exceptional energy, self-reliance, resourcefulness, and daring had to be bred. To this race no problem seems insoluble, no enterprise too hazardous, no honest work despicable and no honorable means unworthy.

FOUNDING OF THE BALTIMORE COLLEGE OF DENTAL SURGERY.

The little band which founded the Baltimore College of Dental Surgery was compelled to establish a separate institution. The medical schools would have none of them, and even as the Pilgrim Fathers were obliged to flee from England to found for themselves a *New* England in the new world, so these fathers of modern dentistry were obliged

to found a new school of a branch of medicine. It was an adventurous enterprise. They had neither professional nor public sympathy, nor wealth. They were a little band of, for their time, educated men, who were convinced that they had a mission to raise a humble and undefined calling to the dignity of a profession. The little candle which they then lighted has now become a glowing flame which shines throughout the world. For from that moment dentistry was established upon a scientific basis; that is, it was for the first time efficiently taught upon the general principles upon which medicine is founded, with the addition of special manual training, and therefore its future was secure.

The reasons for its rapid progress are found not only in the character of the men who undertook it, but also in the public conditions, both social and material, which especially favored it. There were no hide-bound popular prejudices to overcome. The complete independence of American thought and character, the existence of a rapidly growing, prosperous and intelligent population, keenly desirous for improvement, mental and physical, and the characteristic ingenuity of the race, all tended to advance the new movement. Especially in dental art, where, as perhaps in no other profession, the usefulness of the practitioner is so largely dependent upon native ingenuity, the notable resourcefulness of the descendants of the original Americans and of those more recent arrivals who imbibed the spirit of the country, is a factor of great importance. Our ancestors were obliged to be severely practical, and the qualities they so admirably developed became hereditary in their descendants. Look only at the long list of inventors whose discoveries have blessed and illuminated the world, and see how frequently occur the names of Americans of English origin. Even so in dentistry. Much as we owe already, and much as we shall in the future owe to European colleagues, it is questionable if any one nation in the course of another seventy years will again present a list of such amazing achievements, from Wells to Taggart, as is combined in the progress of what we proudly call American dentistry.

But let us use this term in no invidious sense. Ours is but an episode in the general progress. So long as nationalities exist, so long there will be, not only American, but also English, French, Germanic, Latin, and Slavonic dentistry, each country stamping the characteristic qualities of its race upon our profession. Ours has been the opportunity of founding the first schools of instruction and of furthering the science and especially the art of dentistry by a constantly increasing output of important investigations and inventions. It was a great opportunity, and nobly has it been met. But, other times, other manners. It is a question whether dentistry may not now have passed its brilliant adolescence and come at last to the less intoxicating season of maturity, requiring for its future progress more elaborate and profound training, and qualities in which other nations may be our superiors. And can we expect, in such an era, American dentistry to maintain its relative position? As a contribution to providing an answer to these questions, I venture to give you a short sketch of the position of our specialty in some European countries.

PROGRESS OF DENTISTRY IN GREAT BRITAIN.

Let us first consider the progress of dental science and art in Great Britain, that country to which America owes, in dentistry as in so many other particulars, its worthiest inspirations.

As might be expected in the land of Hunter, there were early efforts to place dental education upon a scientific basis. Already in 1843 an attempt was made by a little band of accomplished English practitioners, upon the occasion of a bill being presented to Parliament in which it was proposed to alter the charter of the Royal College of Surgeons, "to oblige parties purposing to practice as dentists to pursue a course of education similar to that followed by those intending to practice surgery, and to gain for themselves a similar diploma." Hill, in his valuable

"History of Dental Reform," published in 1877, sums up the failure of this effort in these words: "From many causes at that time in operation, which, when regarded as a whole, doubtless left the impression on the minds of the gentlemen who had thus far acted in this matter that the attempt to better their profession was impracticable, the scheme, which had been devised with the best intentions and pushed forward with considerable energy, was very reluctantly but altogether abandoned."

It is curious to reflect upon what might have been if that effort had succeeded, and if, contemporaneously with the commencement of the scientific education of dentists in America, a similar beginning had been made in the mother country, and how the two systems would have reacted upon and influenced each other. An identical system would not have been suited to both countries; but it would have been of benefit to both if they had had from the beginning such friendly rivalry. But it was not to be, and even the founding of the Odontological Society could only take place in England some seventeen years later than the inauguration of the Society of Dental Surgeons in America.

THE ODONTOLOGICAL SOCIETY *vs.* THE COLLEGE OF DENTISTS.

In 1857 two important bodies were formed in Great Britain—one the Odontological Society, with a membership of some fifty distinguished practitioners of dentistry, men chiefly of conservative sentiments and longing for union with medicine, and the other the College of Dentists of England, a body about three times stronger in numbers than the former society and having for its purpose, to quote from their published statement—"to unite the members of the dental profession into a recognized and *independent* body, and to provide means of professional education and examination. The manner in which it is intended to seek the attainment of these objects is to invite all dentists practicing as such *exclusively* and *legitimately,* to become members of the college. This invitation is extended to the 31st of December 1857, after which period it is proposed to provide means whereby the competency of each candidate for membership must be satisfactorily proved by examination."

This was a most interesting and instructive contest between the advocates of dentistry as a specialty of medicine and those who desired it to be an independent profession. To be sure, the great body of dental practitioners remained aloof, if not indifferent, but the battle waged with great pertinacity between the two opposed societies, both of which contained many able men. Unwillingness of these societies to unite upon points upon which their opinions were not dissimilar prevented the early establishment of either system, and it was only in 1858 that the Odontological Society succeeded in instituting the London School of Dental Surgery and the Dental Hospital of London, anticipating the intentions of the rival society. Practical unanimity in the smaller body triumphed against wider divergency of views in the larger, and Parliament shortly after empowered the Royal College of Surgeons to institute examinations and to grant certificates of fitness to practice dental surgery. In 1859 the dental charter was complete, having received the royal assent.

But, great as was the triumph of the Odontological Society, a large number of dentists still condemned affiliation with the Royal College of Surgeons as a blunder, and trusted that a charter might yet be granted to the independent Dental College. They continued to insist that dentistry was a separate and distinct profession from surgery. They established the Metropolitan School of Dental Science and began to issue diplomas to dentists, regardless of how they had been trained, if only they were, to quote their own words, "of good character," and if they possessed "the standard of knowledge we consider requisite."

This was, of course, a source of weakness, for there could be no comparison between a diploma having no legal standing or value, and one which was conferred by recognized authority, confirmed

by act of Parliament, and approved by the Crown. This act empowered the Royal College of Surgeons to appoint a board of examiners in dental surgery, to consist of not less than six members, three of whom must be, according to the reading of article first, "members of the court of examiners for the time being of the said College, and the others of them shall be such persons skilled in dental surgery as the council of said College shall from time to time think proper to appoint." This important act established a *department* of the Royal College of Surgeons. The graduated students were not *members* of the College, but *licentiates* of this department only, their position being defined by the concluding words of the act: "Provided always, and it is Our further will and pleasure that these presents shall not operate to create, or be taken or deemed to confer upon any person who shall obtain such certificate of fitness as aforesaid, any right or title to be registered under such Medical Act in respect to such certificate."

Therefore, notwithstanding the College of Dentists had also founded the National Dental Hospital, which was doing important work, and notwithstanding the considerable popular and professional support the college was receiving, and notwithstanding the ardor with which they and their friends had defended their views, it was at last evident to this energetic and persistent party that theirs was a losing cause. Accordingly, after the manly and disinterested method with which Englishmen are accustomed to compromise disputed questions for the general good, a characteristic union was effected, and this vexed contest seemingly settled for all time.

THE UNION.

The first article of the union reads: "That the title The Odontological Society of London be abandoned in favor of the title The Odontological Society of Great Britain, for the purpose of embodying the members of the College of Dentists of England under the latter title with the members of the Odontological Society of Great Britain." I cannot refrain from quoting the words of the eminent Sir John Tomes, who presided over the meeting of the Odontological Society of London at which this union was voted—words worthy of the great man who uttered them and fit to be remembered by professional men in all time: "When a body of men are willing to abandon their own special views in favor of a common cause, and have acted in the spirit in which the College of Dentists have acted on the present occasion, it is not for us to scrutinize the past too closely, but it is for us to receive them with liberality, placing implicit confidence in the future. If in adopting a liberal course we can embrace a number of men who have been in the habit of advertising, and can thereby induce them to abandon this unprofessional practice, it will be to the general advantage of the profession. Before taking my seat I must protest against the general accusation of inferiority preferred against the members of our profession. There are many practitioners unknown to us who hold as high a position in town and country as those who frequent this room. We are too apt to class those we do not know with the inferior men with whom we happen to be brought into contact—a tendency calculated to produce mischief, and one we shall do well to abandon."

Thus we see it required, from the first effort made in 1843, twenty years, that is until 1863, to unite the dental profession in Great Britain upon a common policy of education and practice. Observe also that the ultimate coalition was the triumph of the educated mind. In the one camp were many honorable and gifted men, who largely outnumbered their opponents and who were possessed of great enthusiasm for their cause; but it is no disparagement to say that their average of educated men was surpassed by their rivals. This gave, in such a long contest, the advantage to the smaller and perhaps less demonstrative body, and furnishes another example of the soundness of the principle upon which popular

institutions in politics as well as in the "republic of letters" rests in all countries—the best men will win.

I remember when the American civil war was over and the Emancipation Society was disbanded, some of its members were heard lamenting that, now slavery was abolished, there remained no moral question to contend for—oblivious of the eternal fact that each generation has its own special phase of the same battle, and the conflict between good and evil is seemingly conterminous with the life of the human race.

THE DENTAL ACT OF 1878.

If the members of the Odontological Society of Great Britain cherished the belief that their trials were now over, their minds were soon disabused of this illusion. It was but the beginning of a new period of "storm and stress" which has lasted until our time. It has consisted in the impossibility of educating and assimilating a great body of unqualified and unregistered practitioners of dentistry. The dental act of 1878 was necessitated by the failure of the act of 1859 to accomplish its purpose; but the later act has proved to be likewise inefficient. The regard which British law has for vested interests appears to be the chief difficulty in the way of framing an act which shall not work individual injustice and yet shall prevent increase in the ranks of unqualified practitioners. The act of 1879 seems to have accomplished little more than to prevent unregistered men from calling themselves dentists, while not preventing them from practice. Still, English methods have developed a highly educated and accomplished upper class of dentists, and another class less accomplished intellectually, but frequently able to do excellent technical work. There was no time, during the years in which operative dentistry made such progress in America, and mechanical dentistry fell (for many reasons, but largely because of the introduction of vulcanite) so low, when there was not preserved in England the tradition and practice of what we may call the golden age of prosthetic dentistry. To this day English dentists, even those who are not of the higher class, turn out plate work of an excellence not too often seen in American practice. We sometimes criticize such work, in spite of its admirable execution, because we feel it is frequently designed to replace organs we should strive to preserve; but such criticism may be based upon an imperfect knowledge of the social conditions which make such treatment justifiable or necessary. I believe all American dentists practicing abroad have derived great advantages from the experience and teaching of their British colleagues in this direction. I may mention as a striking instance the use of tube teeth in plates and bridges, an art which Englishmen have brought to great perfection. But the general tendency of the educated English mind has been toward what we may call, for lack of a better expression, the scientific rather than the technical side of dentistry, and therefore it could not be expected that the latter should attain equal advancement with the former. Progress, great progress was made in both directions, but, despite the above-mentioned praiseworthy tendency, much thought and energy needed for other purposes have been diverted to contentious questions, and general advancement has been somewhat retarded; so that, after all these years, the legal position of the dental profession in England is still in a state of chaos.

THE ROYAL SOCIETY OF MEDICINE.

It will be noticed that the progress toward making dentistry a branch of medicine has constantly advanced. In 1907 the Odontological Society of Great Britain celebrated its fiftieth anniversary, and then ceased to be a separate body. It joined the medical societies of London in forming the Royal Society of Medicine, a scheme designed to bring all the members of different branches of medicine and surgery into closer touch with each other. The societies remain as "sections," keeping their own councils and conducting their own meetings, but

each having a representative in the "general council" of the society. The transactions of the sections are published in one volume, which gives to each a wider circulation and influence. Many holders of the Licentiate of Dental Surgery degree take also the higher diploma of Member of the Royal College of Surgeons, a degree which is practically necessary for any important dental appointment. The dental students, distributed among some twenty dental hospitals throughout the United Kingdom, in their four years' course are for two years students of medicine. But there are far too few of them for the requirements of the country, and it is a question how their numbers are to be increased. The only practical course seems to be the securing of legislation which will make admission to practice at last only possible through the dental schools. Simple as this proposition may seem to Americans, it is by no means simple in Great Britain, nor in some other European countries. But after the necessary legislation has been achieved we shall see the whole body of British dentists gradually raised to the high standard of scientific and technical attainment which so justly distinguishes the better educated men. The number of registered dentists in the United Kingdom, not all of whom are Licentiates of Dental Surgery, is 4399, and of the unregistered there are 2114. The combined numbers, 6513, even if all were highly qualified men, would be considered, from the American standpoint, inadequate to the needs of 44,000,000 of people.

British dentistry follows the racial type. It is conservative, it respects tradition, and it honors scholastic training. It is reticent in expression, suspicious of enthusiasm, and usually unready to adopt foreign methods from the very fact that they are foreign. It is dignified, self-respecting, and sincere. If it does not as yet enrich our profession with epoch-making discoveries, it constantly endows it with solid additions to the common stock of knowledge and it holds fast that which is good. Its interest in and tolerance of foreign ideas are constantly increasing and its influence in international councils is not only great, but is destined to become vastly greater.

I have dwelt at considerable length upon the progress of British dentistry, although most inadequately in view of the importance of the subject, because it illustrates so well the nature of the problem with which all Europe has had to deal, and therefore enables me, in regard to other countries, more completely to condense the references I wish to make.

DENTISTRY IN FRANCE.

But if conservatism, dignity, self-respect, and solid worth characterize English dentistry, so brilliancy, originality, versatility, and daring have characterized French dentistry, from Ambroise Paré and Pierre Fauchard to Delair and Godon. The logical habit of the French mind and the lack of devotion to tradition have made the task of establishing a uniform method of education, and of placing dentistry upon a basis which will eventually prevent practice by unqualified men, far easier than in Great Britain. As in England, the requirement of a relentless preliminary examination for admission to the study of dentistry has been insisted upon; but, unlike England, an organic connection with the Faculty of Medicine has not been considered as yet imperative. The Paris schools are connected with the Academy of Paris and are recognized as institutions of public utility, but are not under control of the Faculty of Medicine. The schools at Nancy and Bordeaux are connected with the medical faculties of these cities, but have no connection with the medical faculty of Paris. The diploma of Surgeon Dentist is totally separate from that of Doctor of Medicine, and does not permit the holder to practice medicine; but the medical man may practice dentistry without holding the dental diploma. At present, the dental student matriculated before October 1909 is eligible for graduation after three years' study, but after November 1911 he must pass a more rigorous examination, and have two years' training in mechanical

dentistry and metallurgy, and study for three years operative dentistry, thus making a professional course to cover five years.

The French graduate may practice in any part of France or her colonies. The result of the dental act of 1892 has been to largely diminish the number of unqualified dental practitioners, and it has unquestionably elevated the position of the whole profession. It seems most probable that, with the logical development of the system, the time will arrive when dentistry will become in France a recognized branch of medicine and its practitioners will hold the medical degree.

Time does not allow mention of the many important contributions that Frenchmen have made to modern dentistry. Suffice it to say that their technical skill and rare ingenuity, and their esthetic taste, as well as their marked talent for scientific research, gives them a most important rôle in the progress of our profession.

DENTISTRY IN SPAIN.

The Spanish government, by a royal decree, which was largely owing to the influence of Aguilar, established in 1901 a Department of Odontology in the Faculty of Medicine of Madrid. Instruction is given by professors paid by the state, the students paying their matriculation fees to the treasury of the ministry of Public Instruction. The preliminary education of the dental student must be the same as for entrance upon the study of medicine, pharmacy, philosophy, or law. The medico-dental studies last for five years, only two of which are occupied exclusively with dental subjects, and medical graduates may not practice dentistry without passing a special dental examination, the law strictly prohibiting the practice of dentistry by persons not holding a professional degree.

REMARKABLE PROGRESS OF DENTISTRY IN GERMANY.

In no country has there been more striking progress in the last quarter of a century than in Germany. When, fifty years ago, the Central Verein was founded, dentistry in Germany was sadly undeveloped. There were only some two hundred and fifty Zahnärzte in the whole country, and these men, conscientious and intelligent as most of them were, had great deficiencies of training. Practice consisted chiefly in supplying artificial teeth, and conservative dentistry was almost unknown or regarded as impracticable.

But, in the great awakening which accompanied the founding of the empire, dentistry, like every other pursuit, experienced an exhilarating development. In Berlin, in 1884, the first University Dental School was established, the first professors being Bush, Paetsch, Sauer, and Miller. Modern German dentistry may be said to have been born then, and it has grown within twenty-five years into splendid and vigorous manhood.

From that time no students were admitted who could not conform to an undeviating standard of preliminary education, and the instruction they received was marked by German thoroughness. I doubt if in any other dental schools such eagerness to learn is to be found as in Germany, and the result has been phenomenal. Some of us Americans who were then in Germany questioned if the Germans would readily become good operators. We long ago abandoned all doubt upon that subject. As might be expected from the German character and training, there was, from the first a noticeable tendency toward scientific investigation. This has caused a steady increase in the flow of monographs, textbooks, pamphlets, and essays of great scientific value, until they almost assume the proportions of a flood. Time would fail to give an exact list of the output of such important works, even for a single year, and the hearty reception and most intelligent discussion of such works reflect the highest credit upon the German profession at large.

Modern German dentistry is not a renaissance, it is a new creation, and it owes much of its vigorous and phenomenal growth to the influence of Miller and the

little group of able men who walked by his side. But no teaching, however inspired, could have accomplished such results with a people less susceptible to the value of method and order, less convinced of the necessity of progress and the uplifting power of education, less sensitive to the claims of humanity for relief from curable disorders, and less accustomed to follow the straight path of duty.

There are now some three thousand well-educated dentists in Germany, and about four thousand five hundred unqualified practitioners, some of whom are men of the highest attainments but for various reasons have been debarred from coming up for the formal examinations, and some of whom are but simple technical men, but all of whom are permitted to practice under the present law. Germany has, therefore, an educational problem similar to that of Great Britain in finding a way which, without working injustice, shall eventually place the whole dental profession upon a final basis of identity of qualification for practice. The problem is certain to be eventually solved, in each of these great nations, in accordance with the tradition and character of their social and political systems.

DENTISTRY IN SWITZERLAND.

In Switzerland, as in Germany, dentistry is a plant of modern growth. In 1881 the Geneva School was founded, but its diploma enabled the holder to practice in the canton of Geneva only. In 1888 a federal Swiss diploma was authorized, and in 1895 a second dental school was founded at Zurich. Dental instruction is now closely connected with the universities. The preliminary requirements are the same for medical and dental students, and about four years' study is necessary for completing the usual course.

The effect has been similar to that experienced by Germany in raising the standard of scientific and technical attainment and in increasing the influence and usefulness of the profession. Of the four hundred dentists practicing in Switzerland, some three hundred and fifty have Swiss diplomas, and about eighty of them have American degrees also. The Swiss dentists resemble the German colleagues in their eagerness for acquiring knowledge and their enthusiasm for scientific and practical work, in which many of them have become eminent.

DENTISTRY IN THE AUSTRIAN EMPIRE.

The progress of dental science and art in the Austrian Empire is peculiarly interesting, since dentistry there had always been regarded as a distinct specialty of medicine. Already about 1830, some ten years before the founding of the Baltimore College, Georg Carabelli was appointed instructor in dentistry at the University of Vienna, and one of his pupils, Moritz Heider, was appointed instructor in 1843 and was made "professor of dental science" in 1859. This modest beginning was not immediately productive of great results, but it prepared the way for the striking development Austrian dentistry has experienced during the past twenty years. And this development has been obtained under the following conditions:

Dental practice has only been legal, except in a few cases where foreigners have been permitted to practice by favor of the Crown, for those who possess the *Medicinæ Universæ Doctor* of the empire. To obtain this degree the candidate must have passed the final examination of an Austrian gymnasium, and then have spent at least five years in a university medical school. Upon receiving his degree it is open to him to immediately commence practice, or to pursue special studies for a further period of time. The Austrian medical authorities took the ground that dentistry was an integral part of medicine, and therefore it was inconceivable that it should be taught or practiced by anyone who had not received the education everywhere regarded as essential to general medical practice.

From these premises the conclusion was inevitable, and the medical faculty has shown its consistency in providing

at the University of Vienna, since 1903, that certain instruction in dental science should be obligatory upon all medical students.

It is perhaps not surprising, notwithstanding the efforts of the able and enthusiastic early instructors in dentistry, that this specialty did not appeal with much force to the ordinary graduate until modern times. That appeal came with the rise of the modern science of bacteriology. Who, even among the humblest practitioners of the healing art, has not had his intellect quickened and his imagination kindled into flame by the wonderful revelations of this new department of knowledge! Imagine its effect, therefore, upon the highly trained mind of the Austrian physician. At once the theory of the origin, the treatment and the prevention of disease began to assume orderly form and to rest upon sure foundations. The integrity of the human body, the dependence of the whole upon the good condition of every part, the serious effects caused by imperfect development or even trifling disorder in any single organ, made it plain that there was no such thing as an insignificant specialty of medicine, and that dentistry might well be one of the most important. From the moment the chemico-parasitical theory of dental caries was established and the mouth was found to be the chief breeding-place of many of the most dangerous micro-organisms, the practice of dentistry was no longer unworthy of the most carefully trained medical scientist. From this period dates the new birth of Austrian dentistry.

Dental institutes are now connected with the universities of Vienna, Budapest, Prague, Innsbruck, Graz, Lemberg, and Crakow, each having one professor, two assistants, and a verying number of demonstrators. The output of literature, scarcely any of it unimportant and much of it of high value, has been very great. It is claimed that the fear that their system would not result in making good operators has not been justified. The Austrian schoolboy has considerable instruction in the use of his hands, and this is supplemented, when he becomes a student of medicine, in the work of the chemical laboratory, in preparing histological specimens and in the operations of general surgery. It is, however, to be observed that, during some ten years, the Central Verband Oesterreichischer Stomatologen, the Verein Oesterreichischer Zahnärzte, and the Verein Wiener Zahnärzte, have been repeatedly petitioning the Faculty of Medicine to prohibit dental practice and the title of Zahnarzt to medical graduates who have not also had two years of continuous training in operative and technical dentistry at the university. Throughout the Austrian Empire, containing 47,000,000 of inhabitants, there are between 1500 and 1600 practitioners of dentistry who have the medical degree, and probably an equal number who have not this qualification.

At the Stomatological Clinic at Budapest, inaugurated in 1908, there are some eight beds for patients under surgical treatment which cannot be carried on conveniently or instructively at the general surgical clinic, an innovation which has been proved to be of great importance.

DENTISTRY IN ITALY.

In Italy, with a population of 33,000,000, there are about 650 dental practitioners, of whom about 180 possess the medical qualification. The abrupt law, passed twenty years ago, forbidding admission to dental practice from that date except to graduates of medicine, and not requiring from them special dental training, is largely responsible for this unsatisfactory condition. But social conditions, as for instance the general poverty of the Italian people, have had, no doubt, an important influence.

DENTISTRY IN BELGIUM.

In Belgium, that beehive of industry, which has a population only about one-fifth as large as Italy, with a similar restrictive law and absolutely no schools in which dentistry is taught, there are about 900 dental practitioners, some 300 of whom hold the medical degree.

DENTISTRY IN HOLLAND.

In Holland, since Grevers has become director of the Dental Institute of the University of Utrecht, a new spirit has pervaded dental instruction. Medical men, practically destitute of training for the purpose, may still practice dentistry, but the influences at work are sure at last to eliminate from practice all those who have not received a thorough dental as well as medical preparation.

DENTISTRY IN SCANDINAVIA.

In the Scandinavian countries, Denmark, Sweden, Norway, the conditions are very similar to those which prevail in Switzerland.

GENERAL TENDENCY OF EUROPEAN DENTISTRY AS TO PRELIMINARY TRAINING.

From the foregoing account, even if imperfect, of the progress of dentistry in Europe, three facts are manifest: First, the general insistence upon requiring from the dental student a preliminary training similar to that demanded of the medical student. Secondly, a determination to immediately or eventually oblige dentists to pursue a regular medical course and take the medical degree. Thirdly, that the tendency of these methods is to produce a superior but as yet limited body of practitioners, animated by a true professional spirit and possessing great and ever-increasing public influence. This latter fact is illustrated in the remarkable progress made in establishing school dental clinics in various European countries, and in the unique distinction shown to the Fifth International Dental Congress by the German government in not only sending its ministers of Public Health and of Education to greet and confer with the congress, but also in placing the splendid national House of Parliament at its disposal for its meetings.

It is not for us to argue against these European tendencies. They are in accord with European traditions, and we must accept them as we accept the phenomena of nature, and study them for our profit.

LESSON TO BE DERIVED BY AMERICAN DENTISTRY.

In view of such great and admirable European progress, what must we do to maintain the high position which American dentistry has hitherto occupied? We remember with just pride that this is the one branch of medicine in which America has made a conspicuous return for the wealth of learned and scientific general medical instruction which Europe has for generations so lavishly poured out for us. It would be an occasion of deep humiliation should the day ever dawn when European students of dentistry should cease to come to us. Certain advantages we shall doubtless for a long time continue to possess. One of these advantages is found in the great activity, independence, and ingenuity of the American mind. Another is found in our preponderating numbers. There are probably more men intelligently practicing dentistry in North America than in combined Europe, and the number of American instructors must also be considerably greater. But these and other advantages will not avail, in the long run, if we are surpassed by Europe in more thorough and more intelligent systems of instruction. I suppose no reasonable man in our time has a superstitious regard for the medical degree. "The rank is but the guinea's stamp, the man's the gold for a' that." But whatever degree we may confer upon our American dental graduates, it must come to stand for a disciplined and cultivated mind: for an education founded upon a thorough training in those sciences universally regarded as forming the indispensable basis for the practice of the healing art: for hands trained to execute the most cunning devices of the mind: for a body unwearied in the exercise of the most exhausting practice in the whole range of surgery: for a character in which patience and benevolence shall temper a noble ambition.

Before us is an ever-broadening hori-

zon. If we are faithful to our sacred trust we shall at last eliminate those dental and oral diseases from which our race has suffered so greatly and through which its progress has been so sadly retarded, and behold the advent of a new and nobler type of humanity, whose achievements shall surpass our brightest visions.

TUBERCULOSIS: PREVENTIVE MEASURES FOR THE DENTIST AND HIS *CLIENTÈLE.*

By Dr. LAWRENCE F. FLICK, Philadelphia, Pa.

(Read before the Pennsylvania State Dental Society, at its annual meeting at Harrisburg, July 28, 1910.)

THE occupation of the dentist is in a measure favorable to the dissemination of tuberculosis. The dentist operates on the mouth, which is the usual avenue of exit of matter bearing tubercle bacilli, and the dentist's office becomes the temporary habitat of the consumptive in the transaction of business. Contamination of the fingers and clothing of the dentist, contamination of instruments, and contamination of the dentist's office are the ordinary ways in which new implantations might occur.

There are two persons to be thought of in considering the spread of tuberculosis in the dentist's office—the dentist and his patient. The dentist himself is in vastly greater danger than the patient, because he is more continuously exposed to whatever opportunity for implantation there may be.

MODE OF TUBERCULOUS INFECTION.

For implantation of tuberculosis a more or less continued prolonged opportunity for taking in tubercle bacilli is necessary. Casual momentary contact with a tuberculous person or a tuberculous environment is insufficient. Ordinarily tubercle bacilli get out of a host through broken-down tissue, and get into a host from this broken-down tissue through the breath and the food. Every person has some resistance to invasion, however, in his blood-cells and the juices of his body, as these possess the power of destroying tubercle bacilli, and that as fast as they come into the body, so long as the number does not exceed the capacity of the body for their destruction. This inherent power of destroying tubercle bacilli, which everyone possesses in some degree, grows by its exercise, while it is not overcome; and even when it is overcome it can sometimes recover itself by disposing of the accumulated bacilli when an interval occurs during which no bacilli come in. To get an implantation it is therefore necessary to have an exposure to a contagious environment which is capable of overcoming the resistance of the individual. Such an environment may be called a competent contagious environment. The broken-down tissue given off by a consumptive constitutes the *contagion,* the opportunity for getting into the host constitutes the *environment,* and the presence of enough broken-down tissue in a place where it is easy for that broken-down tissue to get into the food and into the breath of those who live in that place continuously and uninterruptedly for a considerable period of time, until it overcomes their resistance, constitutes what we call a *competent contagious environment.* This broken-down tissue may get into one's body in a wet state or in a dry state, but usually

it can do so much more easily in a dry than in a wet state.

THE CONSUMPTIVE HIMSELF LESS DANGEROUS THAN HIS INFECTED ENVIRONMENT.

The consumptive himself is not necessarily dangerous, as the bacilli which are in him cannot be conveyed to another until they have been given off by him in the form of broken-down tissue. The consumptive himself only becomes dangerous when his clothes and the exposed part of his body, such as his hands and his face, have been contaminated with tuberculous matter. To this extent does he become part of a competent contagious environment. Usually what is most contaminated, and what constitutes the competent contagious environment, is the place in which the consumptive lives, because tuberculous matter can readily accumulate there. A competent contagious environment is therefore seldom found in the consumptive himself, but usually in the place in which he lives, and this really constitutes the ordinary means of spreading tuberculosis.

THE DENTIST'S OFFICE A POOR CONTAGIOUS ENVIRONMENT.

With due allowance for the average resistance to implantation of tuberculosis, the average cleanliness of individuals, and the average brevity of the time which a consumptive spends in a dentist's office, it is evident that the dentist's office must rarely become a competent contagious environment. In weighing the danger to the *clientèle*, consideration must also be given to the brevity of time which the ordinary person spends in the dentist's office, which is too short probably for an implantation, even if the environment were entirely competent to produce one. It is indeed scarcely conceivable that a person who goes into a dentist's office at intervals of a few days and spends an hour there at each visit, could take in enough tubercle bacilli from what has been left there by the occasional consumptive who has also visited the office in a professional way, to produce an implantation in the ordinary manner. It may, then, really be assumed that the dentist's *clientèle* cannot contract tuberculosis in his office in the ordinary way.

THE DENTIST'S BREATH, HANDS, AND INSTRUMENTS A POSSIBLE SOURCE OF DIRECT INFECTION.

There is an extraordinary way, however, in which tuberculosis might be contracted in a dentist's office, which must be kept in mind. The dentist himself, by the use of unclean instruments or unclean hands in his work on his patients, may become the medium of communication. It would be possible to convey from the mouth of the consumptive to the mouth of the healthy individual by the hands or by instruments a large enough quantity of tuberculous matter to overcome resistance and produce implantation. This mode of implantation would really be inoculation. Of course it would only be a grossly unclean dentist who would be capable of transmitting such infection, and yet in this connection one must keep in mind that, when dealing with micro-organisms or with matter containing micro-organisms, the ordinary standards of cleanliness do not apply. A dentist might be a very clean man in the ordinary sense of that term, and yet follow practices which would make it possible to carry considerable tuberculous matter from the mouth of the consumptive into the mouth of another patient. The quantity of tuberculous material which would cling to the instrument or to the hands of a person working in the mouth of the consumptive, while small when measured by the naked eye, would be quite large when measured by the number of tubercle bacilli which it might contain. Hence, while it is practically impossible or at least exceedingly improbable for a person to contract tuberculosis in the dentist's office in the ordinary way, it is at least *possible* to contract the disease through the medium of the dentist.

THE DENTIST'S PERSONAL DANGER OF CONTRACTING TUBERCULOSIS.

The danger to the dentist himself of contracting tuberculosis is chiefly of the ordinary kind, namely, that of living in a competent contagious environment, but to some extent also of the extraordinary kind, namely, conveying some of the moist tuberculous matter from the mouth of his patient into his own mouth through objects which he may put in his mouth as a matter of habit or with food. The danger of contracting the disease through a competent contagious environment is slight, because consumptives are not long enough in the office of a dentist to produce such an environment under ordinary circumstances. It is of course possible that uncleanly patients might seriously contaminate a dentist's office by spitting around promiscuously, but it is not probable that a dentist would tolerate such conduct. The amount of broken-down tissue which a consumptive could give off during his stay in a dentist's office, unless it were thrown directly on the floor, would not be sufficient to produce a competent contagious environment. There is probably more danger to the dentist from working over a consumptive patient whose clothing may be more or less filled with tuberculous matter in a dry state ready to be given off in the form of dust at every movement of the patient, than from any contamination which may exist in the office itself. The dentist's own danger of contracting tuberculosis is undoubtedly greater than is that of his *clientèle,* because he is exposed to the infectious environment longer and more continuously. From a practical point of view this is not a serious danger, however. Both, the danger of the *clientèle* and that of the dentist can easily be avoided by the enforcement of very simple rules and practices in the dentist's office.

THE SPUTUM CUP A NECESSARY SUBSTITUTE FOR THE SPITTOON.

Contrary to the generally accepted views and to the practice commonly followed, a dentist should have no spittoons in his office except those at his operating table. Spitting into a spittoon on the floor or even into a spittoon on an elevation from the floor is in itself a dangerous practice, as far as tuberculosis is concerned at least, and probably also as far as all other diseases are concerned, because in spitting away from the body, a person cannot avoid spraying some of the expectorated matter upon his clothes and into the air about him, and besides this, when the expectorated matter is ejected into the spittoon, it may splash over the side of it to the floor. Instead of spittoons it might be well for the dentist to keep in his office a supply of sputum cups which he can give to his *clientèle* when they have not supplied themselves with this commodity and need it. A sputum cup is safer than a spittoon, as it can be held close to the mouth of the expectorating individual, preventing in this way the spraying of sputum and the contamination of the environment of the person expectorating. Not until everyone who expectorates at all has adopted a sputum cup of this kind as a receptacle for his expectorated matter will civilization have protected itself properly against the danger of contagion of various kinds which is due to the spitting habit. The dentist should not only equip his office in such a way that the spitter cannot contaminate it, but he should insist upon such practices on the part of his *clientèle* as would render it impossible for anyone to contaminate his office with disease germs of any kind whatever. This would completely do away with any danger of contracting tuberculosis from a competent contagious environment in a dentist's office, which might arise under any circumstances.

WASHING AND STERILIZING INSTRUMENTS.

For protection against the danger of inoculating healthy patients with tuberculous matter from the mouths of consumptives, or of the dentist inoculating himself from the same source, all that is necessary is scientific cleanliness on

the part of the dentist. All instruments should be carefully cleansed with soap and water, and if possible sterilized in either boiling water or alcohol before being used again. Washing with soap and water is one of the best protections against conveying tuberculosis, because the soap removes the broken-down matter which may be attached to the instruments. Merely dipping an instrument into alcohol would not give protection, because the alcohol is apt to coagulate the broken-down tissue. After the gross matter has been washed off, dipping into alcohol would probably be sufficient.

CLEANSING THE HANDS.

For cleansing the hands of the dentist after operating on an individual, a brush, soap, and water are the best means. There is nothing which comes out of the mouth that cannot be safely removed from the hands with a brush and plenty of soap and water. If this is done thoroughly, disinfection of the hands is unnecessary. Frequent disinfection of the hands is to some people somewhat of a nuisance, because of the irritating substances which are used for disinfection, and the odor which sometimes goes with them, and for this reason it should not be insisted upon unless it is absolutely necessary.

CONCLUSIONS.

With intelligent supervision, the enforcement of proper discipline, and the exaction of proper measures for the prevention of infection in the dentist's office, the dentist can treat consumptives in his office without the slightest danger to himself or to his *clientèle*. Half-hearted methods are insufficient, however, and it is only when the dentist insists upon carrying out in full detail the measures which science dictates that he can feel absolutely secure both about himself and his *clientèle*. The measures which are necessary are simple enough, but it is sometimes difficult to enforce them without transgressing the conventionalities of life. In a matter of such importance one should, however, be exacting even though he may give offense. The sooner the world finds out that only the spitter with a sputum cup is safe, and that all other spitters must be tabooed, the better it will be for civilization.

FACIAL NEURALGIA.

By BERTRAM B. MACHAT, D.D.S., Bath Beach, N. Y.

(Paper read before the American Medico-Pharmaceutical League, New York, N. Y., May 23, 1910.)

THE subject of facial neuralgia is one whose intricacies are the neutral field of the general medical practitioner, the rhinologist, the oculist, the aurist, the stomatologist, and the oral or dental surgeon. This borderline field engages the services of us all, and presents so many phases of interest to each specialty that an exhaustive account would be impossible in the short time allotted, therefore the subject is treated merely in a general way, and particular attention is given to the diagnosis and treatment of facial neuralgia from the dentist's viewpoint.

This appropriate assemblage of specialists of the various branches of the healing art presents a most opportune occasion for the consideration of this complex ailment, for unlike most other sufferers

from disease, the victim of facial neuralgia has come knocking at the door of each and every one of us.

IMPORTANCE OF CORRECT DIAGNOSIS.

Not infrequently it happens that cases of facial neuralgia are referred to the dentist for the exclusion or confirmation of dental disturbances as etiological factors. On the other hand, many cases of facial neuralgia which primarily solicit the dentist's services prove to be manifestations of more remote or general systemic derangements, such as migraine, malaria, syphilis, rheumatism, general anemia, also toxic and idiopathic conditions.

Teeth are too often sacrificed to the extent of leaving the patient practically edentulous, in an attempt at relief of facial neuralgia, without material success. It becomes, therefore, the physician's duty to be conversant with the effects produced upon the dental organs resulting from general systemic disturbances, as well as with the causes that arise within the mouth and manifest themselves in the forms of pain of the eye, the ear, the forehead, etc.—so-called idiopathic facial neuralgia.

LOCAL CAUSES OF FACIAL NEURALGIA.

The local causes of facial neuralgia are confined to that part of the head whose sensory nerve supply is derived from the trigeminus. We must carefully follow the course of this nerve from its point of division at the Gasserian ganglion, where the ophthalmic and the supra- and infra-maxillary main trunks are given off, these dividing and subdividing, ramifying and anastomosing in the remotest of these parts. We must also study the relation of this great sensory nerve with the portio dura or facial nerve, and the portio mollis or auditory nerve, in order that we may logically and scientifically explain the peculiar reflexes that may occur as a result of irritation of some remote nerve-end in apposition to dental anomalies.

Some of the local causes of facial neuralgia with which the dentist is mostly familiar, and which may go unnoticed by the physician owing to the absence of apparent subjective symptoms, are—(1) Calcification of pulps in teeth; (2) caries and erosion of teeth, these being the most common causes of reflex pain; (3) malposed, supernumerary, unerupted, and impacted teeth, cases of which will be presently illustrated; (4) hypercementosis, a condition difficult of diagnosis and one that may be responsible for constant or intermittent pain of the most protracted nature, as will be shown, and (5) interstitial gingivitis or pyorrhea alveolaris. There are also causes that are more manifest, such as (6) alveolar abscess, (7) infections of the antrum, (8) infections and swelling of the salivary and neighboring glands, (9) catarrhal affections of the mouth and nasal cavity, and (10) tumors benign and malignant, necrosis, arthritis of the temporo-maxillary joint, etc.

DIAGNOSIS BY RADIOGRAPHY.

It may be said with reasonable certainty that when facial neuralgia is unilateral, the underlying cause will be found in many cases within the dentist's field. As a diagnostic factor, wherever possible, radiography is advised. Its value in determining unsuspected cases, as well as in facilitating the operative procedure, is incalculable.

OPERATIVE TREATMENT, WITH REPORT OF CASES.

Where a definite diagnosis cannot be determined owing to the absence of sufficient subjective symptoms or objective data, and when a radiograph is either inconclusive or lacking, palliative treatment is advised. If the cause of the pain has been localized, the most gratifying results have been obtained by resorting to operative measures, as will be illustrated by the following cases:

Case 1. Mr. E. L., forty-eight years of age, with fair general health. The patient is edentulous, and complains of pain of the face,

ear, and eye, on the left side. He is under treatment at the Manhattan Eye and Ear Hospital. The pain is of several months' duration. The patient is wearing an artificial lower denture, which he asked to have trimmed. Examination of the mouth showed some inflammation in the lower canine fossa on the affected side. The patient was advised to leave the plate out of the mouth. A counter-irritant was applied to the affected part, and an astringent mouth-wash was prescribed. The patient returned several days later complaining of intense pain of the ear, particularly the mandible on the corresponding side. Examination showed advanced inflammation of the left mandible and a distention or swelling in the neighborhood of the canine fossa. The patient was taken to a neighboring physician, where a fluoroscopic examination, though it was not distinct, disclosed some foreign mass in the affected part of the mandible. Under local anesthesia a horizontal incision of the anterior plate, extending about the full length of the fossa, was made, and the prominence was explored, when it was found to be movable. With a chisel this was lifted out, and it proved to be a malformed canine. Its position in the jaw was horizontal with the morsal surface toward the median line and the apex outward and downward. The pain in the ear stopped immediately, and the aching of all the other affected parts soon ceased.

Case 2. Mrs. F., thirty-nine years of age, married, mother of five children, complains of neuralgia of the right side of the face involving the eye, ear, forehead, cheek, teeth, and palate of the affected side. The pain is periodic in nature, appearing at intervals on Saturdays or on Wednesdays, and disappearing for a week at a time; during these onsets the pain is so intense that the patient must take to bed. The case is of twenty years' duration, during which time it has been treated by the most eminent neurologists, oculists, aurists, and psycho-therapists without success. The patient was referred to me for advisement by a colleague and a member of the medical profession, who for years has studied the border-field already referred to, and as a consequence has become very familiar with dental anomalies and their pathological involvements. Examination of the mouth showed normal arches with well-kept, beautiful teeth, all the adjacent tissues in the pink of condition, and save for a missing lower right molar and what appeared to be an upper right molar, the denture could have been considered perfect. A radiograph was advised, in order to ascertain the probability of an unerupted impacted upper third molar, the lower molar having been extracted. Radiographs were taken (see Figs. 1–3), and careful examination of them will show that the

Fig. 1.



Fig. 2.



Fig. 3.



second molar, not the third molar, in the maxilla is missing, and that the anterior root of the first molar is hypertrophied to the extent of forming a bony mass at right angles and directed anteriorly internally and slightly superiorly. That this may be pressing upon a small branch of, or upon the middle dental nerve, a subdivision of the superior maxillary nerve, had to be seriously considered. Removal of the apex of this root, together with its osseous growth, was advised. Subsequently the patient had the tooth removed elsewhere. The periodical pain with its entire chain of symptoms ceased immediately. Some twenty months later the patient came to consult me in regard to what she characterized as the "old trouble," which had been recurring periodically, and commonly on Wednesdays. The pain was simulating migraine, and gradually becoming more severe. At this time it was thought that the growth above referred to had probably not been removed, owing to its peculiar position. Injections of alcohol, and of adrenalin and cocain, gave temporary relief only. For the reason stated above another radiograph was advised, and obtained through the courtesy of Dr. Geo. M. MacKee. This disclosed the old enemy—the hypertrophied root-end was still *in situ*. The patient is to be operated upon for the removal of this root within a few days.

Case 3. Master J. L., fifteen years of age, complains of severe pain in an upper left molar. He has been under treatment of the left ear for two weeks. Contraction of the left eyelid was remarkable. Treatment of the tooth proved a panacea, for the pain of the ear ceased simultaneously with that of the tooth. The eyelid relaxed immediately to normal.

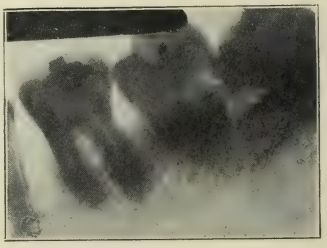
Case 4. Mrs. C., thirty-six years of age, with good general health, complains of facial neuralgia of five years' standing. The pain is unilateral and radiating from the ear to the forehead and the molar and malar regions of the left side. Examination of the mouth disclosed nothing abnormal, excepting an oblique position of the lower left molars on the affected side. Radiographs (see Figs. 4 and 5) showed the third molar wedged obtusely against the second molar, forcing this with its anterior neighbor forward. The tooth was removed about two months ago, and so far there has been no recurrence of pain.

FIG. 4.



Lingual aspect.

FIG. 5.



Buccal aspect.

Case 5. Mrs. A., thirty years of age, pregnant, complains of neuralgia of the right side of the face, the pain being most severe about the eye and forehead on the affected side. The ear is affected intermittently.

FIG. 6.



This case is one of many years' standing, the pain having appeared during the patient's first pregnancy. Lacrymation on the affected side during these attacks was constant. Examination of the mouth shows the upper right and lower right third molars somewhat discolored and crowded, but otherwise all is normal. The patient could furnish no radiograph, in the absence of which the third molar (see Fig. 6) in the mandible was extracted under somnoform anesthesia. The

lacrymation and pain continued for twelve hours, since which, for now six weeks, there has been no recurrence.

Case 6. Mr. F. L., fifty-four years of age, with poor general health, complains of facial neuralgia, and characterizes the pain as paroxysmal and of many weeks' standing; during that time sleep and digestion had been impaired. The teeth were all much abraded and peg-shaped. The upper and lower molars on the affected side were missing. The radiograph disclosed a supernumerary bicuspid wedged between the roots of the two bicuspids. Temporary relief was obtained by free lancing over the affected area. Unfortunately the patient has not returned to have the tooth removed.

CO-OPERATION OF PHYSICIAN AND DENTIST REQUIRED.

In concluding, I wish to reiterate the fact that the diagnosis and rational treatment of this form of neuralgia is a matter of common interest for physician and dentist, and that the quickest relief, and therefore the greatest benefit to the patients, may be insured by encouraging more often consultation and closer union between the physician and the dentist.

THE GOLD INLAY.

By Dr. J. V. CONZETT, Dubuque, Iowa.

(Read before Section II of the National Dental Association, at its annual meeting, Denver, Colo., July 19, 1910.)

IN the opinion of the writer there is no better filling than a good gold foil filling. Gold foil in the hands of the man who is an expert in its use is a material that is unsurpassed for stability and permanence; fillings made with it have demonstrated their perfection by the only test that is a fair one, the test of time. We *know* what gold foil will do in the hands of the master workman, therefore it requires no apologies at this late day.

THE GOLD FOIL FILLING: ITS VIRTUES AND DRAWBACKS.

While it is true, however, that gold foil is a splendid material in the hands of the expert, it is also true that in the hands of the man who has not thoroughly mastered its use, it is the poorest material that can be placed in a tooth, for, if it is not perfectly adapted to the cavity walls, it does not exclude the moisture and the organisms contained therein, and the process of recurrent caries begins almost immediately. Because gold foil is a difficult material for the average practitioner to use successfully, the advent of the gold inlay was hailed with delight by the greater part of the profession. It has come, and it has come to stay. It has a large and very important field of usefulness, but like any new contrivance that has taken the profession by storm, it is producing and will continue to produce a very large crop of failures.

I have been asked to discuss the inlay from the standpoint of a gold-foil enthusiast, and in doing so I want it distinctly understood that I do not enter a discussion of the subject with any disposition to "knock" the inlay, for my studies of the subject have made me its firm friend, and it is being used in an increasingly larger measure in my practice every year. There are some features of the inlay, however, that need empha-

sis, and some mistakes that are being made that should be pointed out.

CONTRA-INDICATIONS AGAINST THE GOLD INLAY.

In the first place the inlay is not indicated in every cavity. There are cases in which the gold foil filling is much to be preferred. In cavities involving the approximal surfaces of the incisors, for instance, an inlay is not indicated, for the reason that a greater amount of tooth tissue must of necessity be sacrificed in order to place an inlay in these positions than would be required for placing a filling. I would not think it good practice to place any filling in any tooth that would make necessary the sacrificing of tooth substance that could be saved with some other material. In order to place an inlay in these cavities, the tooth must be cut away either labially or lingually sufficiently far to allow the inlay to be placed into the cavity. This is not true of the filling, for in these positions only enough of the labial or lingual surfaces need be cut away to insure sufficient extension for prevention, and if the cavity is deeper pulpally, there is no further need of the sacrifice of any more of the external portion of the tooth than that necessary to obtain strength, for the gold can be inserted in the foil form from the approximal surface, and the filling built up with the sacrifice of a minimum amount of tooth tissue.

An inlay is not indicated in the small pit cavities in the molars and in lingual surfaces of the incisors for the same reason, viz, the needless sacrifice of good tooth substance.

INDICATIONS FOR THE GOLD INLAY.

The inlay *is* indicated in all positions where the operator's judgment prompts that he can make a better operation with an inlay than a filling. No two men are alike, and it would be a mistake to insist that every tooth must be filled in this or that manner. Every operator must be the judge of his own ability, and the operator who uses a filling in a place where he knows he cannot make a good one, and in which he could make a good inlay, is doing a grave injustice to himself and his patient.

Cavities in all of the surfaces of the molars and, in many instances, in the surfaces of the bicuspids, have in the past far too often been filled with amalgam because the operator felt that he could not make a perfect gold filling, and being an honest man he preferred to use a material that would save the tooth. To all such men the inlay is a priceless boon, and should be used by them in all such cases.

The inlay is demanded by many patients who have in the past suffered the tortures of the gold filling in the hands of men who were not experts in its use, and who, after having had one inlay made, will not permit the placing of another foil filling. There are many cases in which the inlay is confessedly indicated even by the most conservative foil operators, where formerly crowns or large amalgam restorations would have been employed.

Wherever the inlay is used, whether in the places which the writer thinks are the proper ones for inlays or not, there are certain fundamental principles that must be observed, or the inlay will surely fail, no matter how perfectly it may have been made.

PRINCIPLE OF CAVITY PREPARATION.

The law of extension for prevention is as imperative in the preparation of a cavity for an inlay as it is in a cavity for the reception of any other filling material. This point needs emphasis by reason of the fact that many operators seem to think that the cement is going to save the tooth in spite of the lack of scientific cavity preparation on their part. In some inlays that I have seen, in the cavity preparation only the carious portions seemed to have been removed, then the model was made and the inlay inserted in that cavity. Of course these

inlays failed in a very short time, and the inlays were blamed, while by rights the blame should have been placed upon the operator, who did not know how to prepare a cavity for the reception of an inlay. Many operators seem to think that it is necessary to shape the cavity so that it has strong divergent walls in order that the model can be properly withdrawn, and the consequence is, that in cavities in the approximal surfaces of bicuspids and molars, the labio-gingival and linguo-gingival angles are much too far within the embrasures, and therefore within the area of susceptibility, and a future recurrence of decay is not only a probability, but a reasonable certainty.

We cannot place our confidence in the cement to take care of margins that are in places which cannot be kept clean. The same preparation in the occlusal surfaces leads to the flaring of the walls of the cavity to such an extent that there is no frictional resistance, and the inlay must depend entirely upon the cement for its retention.

The cavity preparation for the reception of an inlay calls for the same care that the preparation of a cavity for a gold filling demands. The preparation is very largely the same in the large majority of cavities. In fact, the writer, to demonstrate that, has upon several occasions made a cavity in the approximo-occlusal surface of a molar, and after allowing the inspection of the cavity has made a wax model, withdrawn it, and allowed the operators present to inspect the cavity and model, and then, without again touching the cavity preparation, has made a gold filling in the same cavity. This was done to demonstrate the fact that the principles of cavity preparation were the same, whether a filling of any kind or an inlay was to be placed in the finished cavity.

The four classical fundamentals of scientific cavity preparation must be observed for an inlay as well as for a filling. They are (1) the outline form, (2) the resistance form, (3) the retentive form, and (4) the convenience form.

THE OUTLINE FORM OF CAVITY PREPARATION.

The outline form comprehends the obtaining of extension for prevention, and the esthetic form.

A good many operators seem to think that the inlay has abrogated the necessity for extension for prevention, feeling that the cement is going to be omnipotent in the prevention of a recurrence of caries no matter what the cavity preparation may be, and it is to combat this impression that I wish to emphasize the necessity for a careful extension of all of the cavity margins well into the areas of relative immunity to caries. That means that all of the margins of the cavity are to be so placed that they will be kept clean by the excursions of food in mastication, or are placed gingivally under the gum margins. All of the fissures are to be cut to their full extent, and the margins of the cavity laid in smooth territory. The bucco-gingival and linguo-gingival angles are to be carried out of the embrasures sufficiently far to be in territory that is kept clean. I wish to emphasize these points, for the reason that I have seen so many inlays that have been inserted in teeth in which all of the laws of extension have been violated, and a failure has been the result. The error most frequently made is the shaping of the cavity in such a way that the gingival angles are considerably within the embrasures, and a consequent susceptibility to caries is found at the bucco- and linguo-gingival angles. The reason why this error is made so frequently is that many operators think it necessary to have flaring cavity walls in order to have the model draw, and the inlay go to place. All of this is fallacy, for the best cavity preparation for an inlay, as well as for a filling, consists in flat seats and parallel walls. Fig. 1 shows the form of cavity preparation that is to be avoided. Here we have the flat seats, but the walls are very divergent, and, as will be seen, cause the gingival angles to be thrown within the embrasures so far as to seriously en-

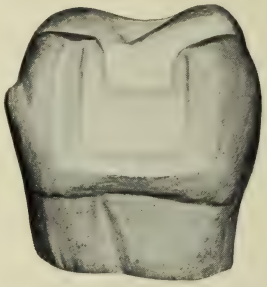
danger their permanence. In the next model (Fig. 2) we have the cavity preparation advised and used by the writer. It

Fig. 1.



Improper cavity preparation.

Fig. 2.



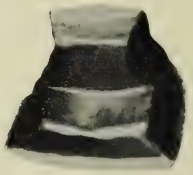
Preparation used by author.

Fig. 3.



Inlay to fit cavity in Fig. 1.

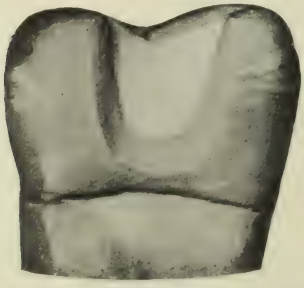
Fig. 4.



Inlay to fit cavity in Fig. 2.

is seen that the seats are flat and the walls are as nearly parallel as it is possible to make them. The cavo-surface angle is beveled all around. In order to show

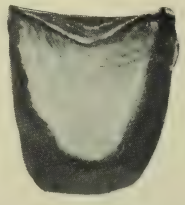
Fig. 5.



A frequent error in preparation.

that a model made in such a cavity will draw without distortion, I will show the picture of the model made from this cavity (Fig. 4), and also the model made from the first cavity (Fig. 3). A comparison of these will make my meaning clearer. Another error made very frequently in the preparation of cavities of this class is shown in Fig. 5. This cavity in the approximal surface of a molar—it might as well be a bicuspid—is cut into from the occlusal surface, but no step is made, and the cavity is not extended into the central pit. As will be

Fig. 6.



Inlay to fit cavity in Fig. 5.

seen, the cavity is made with grooves extending from the occlusal surface toward the gingival seat, and the retention is dependent upon these grooves. The seat in the gingival region is curved instead of being made flat, and the whole cavity preparation is a decidedly weak one, yet it is one that is very frequently met with. In Fig. 6 is shown the model which was made from this cavity, and it shows the

weak points even better than the cavity itself.

THE RESISTANCE FORM OF CAVITY PREPARATION.

The resistance form is that which should be given to a cavity that will resist the forces which will tend to drive the inlay or filling out of the cavity. The very best form that we can give a cavity in order that the inlay may best resist the forces brought to bear upon it is the one that we have been taught to make for our gold fillings, namely, flat seats and parallel walls. We all know that a flat foundation is the most stable one and will best resist any force that tends to displace anything that is built upon it, and those of us who have been using the parallel walls in connection with the flat seats in gold fillings know the value of such preparation in the filling of teeth with gold. I have demonstrated the fact that this preparation is just as valuable for an inlay, and in my judgment is the ideal preparation for the inlay as well as for the filling. I believe that in following this preparation we shall make successful inlays, and in proportion to the amount of our departure from these principles shall we have failures in our inlay work. I heard one dentist say that the advent of the inlay had emancipated the profession from the bugbear of cavity preparation, and that statement and the inlays that I have seen have evidently been made in harmony with such a philosophy as has aroused me to emphasize the importance of a careful study of scientific cavity preparation. We know that dentin is a very elastic substance, and that a gold filling thoroughly malleted into this elastic medium will cause the dentin to hug the filling so tightly that it will be impossible to displace it by any ordinary means. In a cavity prepared in this manner, we will insert an inlay that according to micrometric measurement fits this cavity exactly. We know by the experiments of Dr. Poundstone that it is impossible to compress cement to a layer thinner than 1/1000 of an inch, and yet we force the inlay into a cavity that is lined all around with cement. What happens? The same as when we mallet a gold filling into such a cavity under heavy mallet pressure. The elastic dentin yields under the stress, and then, by reason of its elasticity, hugs the inlay and cement so strongly that it is almost a physical impossibility to dislodge it. But if the cavity is prepared in such a way that it has flaring walls, as illustrated in Fig. 1, the very force that is holding the square inlay in the cavity is tending to squeeze the cone-shaped

FIG. 7. FIG. 8. FIG. 9.



FIG. 7: Inlay cemented to place in cavity in Fig. 1. Comparison with Fig. 8 will show difference in extension of angles.

FIG. 8: Inlay cemented to place in cavity in Fig. 2.

FIG. 9: Inlay cemented to place in cavity in Fig. 5, showing weak points in angle preparation and occlusal retention.

inlay out of the cavity, at least so far that the elasticity of the dentin is satisfied. So the resistance form should be one of flat seats and parallel walls.

The resistance form also comprehends the dimension of depth. This dimension must be determined by a study of the conditions that are to be met with in the finished filling. A filling or an inlay with great depth will resist the forces that tend to dislodge the inlay better than a shallow one, but if the conditions do not call for great resistance, it would be very bad practice to cut a deep cavity when a more shallow one would answer the purpose. I do not believe that we are ever justified in cutting away any more of the healthy tooth than is consistent with the preservation of the entire tooth. If we are ever justified in sacrificing healthy tooth substance, it is because the whole of the tooth may be saved by the sacrifice of a part. In order to judge the amount of stress that the finished inlay is to resist, we must know the occlusion, the strength of the power of mastication, and any abnormalities of occlusion. This knowledge can only come to us by a careful study of the case before we commence our operation.

THE RETENTIVE FORM OF CAVITY PREPARATION.

The retentive form for the inlay is very largely comprehended in the resistance form, for we cannot make a cavity with undercuts of any kind for an inlay. The resistance form is intended for shaping the cavity so that it will resist the forces that tend to drive the filling out of the cavity or to so displace it that its usefulness as a tooth preservative is lost. The retentive form is given to a cavity in order to resist the forces that pull the filling out of the cavity. The thrusts are resisted by the flat seats, and the pulls are resisted by parallel walls, so that the advantages of both the resistance and the retentive form are obtained when the cavity is made with flat seats and parallel walls. Such preparation, in the large majority of cases, also satisfies the convenience form as well.

THE CONVENIENCE FORM OF CAVITY PREPARATION.

The convenience form is that form given to a cavity that will tend to render possible the perfect filling of the cavity; for, no matter how perfect the cavity formation may be, if the filling is not perfectly placed the whole is a failure. It is therefore wise to so shape the cavity that it can be perfectly filled, even if in so doing a considerable part of good tooth structure is sacrificed. This is necessary when for any reason any part of the cavity is not sufficiently accessible to allow the formation of a good model or the placing of the inlay after it is completed.

PREPARATION OF THE CAVO-SURFACE ANGLE AND MARGINS.

The preparation of the cavo-surface angle is a most important part of the cavity preparation, and really belongs to the outline form, but as it is the last step preparatory to the obtaining of a model, I purposely left it to be considered last. The most vulnerable part of a filling is the margin, and if for any reason this portion of the filling is not perfect, the whole filling will fail in the course of time. The strong point of a gold filling is the possibility of obtaining very strong and perfectly adapted margins. This possibility also exists in the gold inlay and if the marginal preparation is correct and the adaptation good, a perfect margin is assured. We know that the enamel rods need protection when their continuity has once been broken. We know that the rods generally bear in certain directions to the dentin in different parts of the tooth; for instance, they generally stand on end at right angles to the dentin and in a measure follow the curves of the latter. But this is not always true, and our knowledge of the relation of the enamel rods to the dentin in one tooth will not assure us of a perfect knowledge of their direction in all teeth. It will be necessary for us to supplement our knowledge of general conditions by a careful observation of the behavior of the rods under the chisel in the tooth under treatment,

and then so lay out our cavo-surface angle that it will be in harmony with the facts deduced by that observation. The enamel should be beveled all around the margin of the cavity, and the bevel should be a very generous one, in order that the finished inlay may have sufficient gold at the marginal bevel to resist the forces that may be brought to bear upon it, for we know that gold will flow under stress if there is not sufficient body of the metal to resist the forces of occlusion and mastication. While this is true of malleted gold, it is even more so of cast gold; for gold is in its softest form when cast, by reason of the fact that it is perfectly annealed in the melting process, and regains its hard character only by malleting and beating. Therefore it is all the more important to have a plentiful body of gold in the inlay in all places that in any degree have to resist the forces that may be brought to bear upon it. This is particularly true in all occlusal and incisal margins, but while no force is brought to bear directly upon the gingival margin, it is very important to have a good bevel here also.

THE "BUTT" JOINT CONTRA-INDICATED.

In my practice I have had occasion to make over more fillings that had failed owing to a faulty preparation of the gingival than of any other margin. In no case would I advise the "butt" joint in this situation, for we shall notice from a study of the enamel rods at this portion of the tooth that the rods incline rootwise, and, if a "butt" joint were made, the short enamel rods would be very numerous indeed, and would in a short time fall out and cause a fault that would ruin the inlay. I do not believe in the "butt" joint in any situation, if it can be avoided, as it is almost sure to leave a space between the tooth and the finished inlay. Time and space forbid a general discussion of the entire subject, and I simply show some illustrations that in a degree are self-explanatory.

MAKING THE WAX MODEL.

After the cavity is prepared, the making of a perfect model is of prime importance. In order to do this perfectly, a good wax is a necessity. The wax that Dr. Taggart gave to the profession was the best that has ever been produced, but unfortunately is not obtainable now. I hope that the time is not far distant when Dr. Taggart will come into his own, and we shall again have the benefit of his genius in the production of the accessories for perfect inlay work. A wax that will maintain its hardness at body temperature is essential to success, for the slightest distortion of the model in withdrawing is fatal to success. The wax must be warm enough to be perfectly adaptable to all of the surfaces of the cavity, and should be carefully examined after withdrawal to see that there is no portion where it failed to adapt itself perfectly to the tooth. This can be determined by examining the model with a magnifying glass, and if there is any place of imperfect adaptation, it will manifest itself in the smooth appearance of the wax at that particular place. The wax should be carved to form, of course, and the anatomical form of the tooth be reproduced as closely as possible.

Particular attention should be devoted to the restoration of the contour, so that the full mesio-distal diameter of the tooth may be restored; for no matter how perfectly a tooth may be filled, if the contour is not restored, and thereby the interproximal space is destroyed, the filling or inlay is a failure. There is nothing more distressing to a patient than to have places between his teeth that are food-catchers by reason of the fact that the interproximal space has not been properly restored. This fault is far too common in the filling of teeth and is most reprehensible, but there is no excuse for it in the making of an inlay, for in this method the contouring of the tooth, the making of the contact point, and the reproduction of the entire mesio-distal diameter of the tooth is so easy that the merest tyro should be able to do it properly.

CONCLUSION.

In conclusion, let me say that the enthusiasm that I have for the gold foil

filling has not diminished in any degree since the advent of the inlay. I still believe in and use the foil, but the more I study the Taggart gold inlay, the more I believe in it and the more I use it. For if properly used—and I speak advisedly—it is one of the grandest blessings that has ever been bestowed on the dental profession. If used improperly, in a shiftless, lazy, get-your-money-quickly-and-easily manner, it will prove a boomerang to the operator who thus abuses it. The gold inlay has proved its efficiency, and it is to be deplored that some of the great operators of the past are so blind to their own, their patients', and the profession's good that they are sulking in their tents instead of doing what they can to eliminate that which may be evil in the inlay, and promoting that which is good. This is my position. I see incalculable benefits accruing to the profession and the public as a result of the perfection of the gold inlay, and on the other hand I plainly see a large crop of disastrous failures from an improper use of a splendid contrivance, and if I may in any way assist in developing the excellent properties and eliminating the possible imperfections of the gold inlay and its uses, I shall feel highly gratified.

POTASSIUM SULFOCYANATE IN THE SALIVA.

By RUSSELL W. BUNTING, D.D.Sc., Ann Arbor, Mich.

THERE has been no subject which has excited more thought and investigation among the dental profession than has that of the cause of dental caries and the exact nature of the factors entering into that process. Speculations were made and theories were advanced as to the cause of caries of the teeth as far back as the Greek philosophers, but the nature of the active principle was not conclusively demonstrated until Miller published his researches in 1881.

Miller, Williams, and others have proved that the destruction of the teeth in caries is due to a lactic acid decalcification, that the lactic acid is produced by certain bacteria found in the saliva, and that the process usually occurs in conjunction with a gelatinous plaque. No satisfactory explanation has been made, however, of the fact that some individuals are more susceptible to caries of the teeth than others. According to the researches of Dr. Black, it has been considered by many as proved that the density—the hardness or softness—of the teeth plays little or no part in the process, and the causative factor which determines the change from immunity to susceptibility of the teeth to caries in the same individual has been sought for in some agency external to the teeth.

THE SALIVA AS AN ETIOLOGICAL FACTOR.

Accordingly, the eye of investigation for the past few years has been turned toward the saliva. Bacteriological and chemical analyses of the saliva have been carried on by a large number of investigators, seeking in that fluid some variable principle the presence or absence of which might determine the immunity or susceptibility of the individual to caries.

Among those who have been prominent in the chemical investigation, Dr. Michaels of Paris has contributed some very valuable information. In his paper entitled "Sialo-semeiology," appearing first in 1900, he draws attention to the relation of the chemical and physical conditions of the saliva to the various disorders of the general metabolism.

Since the publication of that paper considerable investigation has been carried on by men who have become interested in the problem. Notable among these have been Drs. Low, Waugh, Ferris, and others of the scientific committee of the New York State Dental Society.

STUDIES ON POTASSIUM SULFOCYANATE AND ITS EFFECTS AS TO DENTAL CARIES.

The work which has been done has involved the quantitative computation of all the constituents of the saliva. Of these, the one toward which many investigators have turned their attention is potassium sulfocyanate (KCNS). Drs. Low and Waugh of Buffalo and their *confrères* have given a great deal of attention to the sulfocyanate content. They have examined many thousand specimens of saliva and have obtained statistics in regard to the amounts of KCNS present, and the condition of the teeth with respect to caries.

These observers state that the KCNS in the saliva is a very important constituent. When it is present, with but few exceptions the teeth are immune from caries, while it is the rule that in cases which are devoid of KCNS caries is invariably found. Further, in the case of individuals who are susceptible to caries and have no KCNS in their saliva, if KCNS be fed to them in the form of tablets the drug will quickly appear in the saliva, and a condition of immunity of the teeth to caries will be brought about. The opinion of these investigators is that the KCNS has an inhibitory action on the formation of bacterial plaques, and is therefore inhibitory to caries.

Acting upon this theory, many dentists test the saliva of every patient for KCNS, and in case it is absent they administer the drug internally; while others consider that KCNS is of no special significance, and regard the presence or absence of that substance, if it be synchronous with the presence or absence of immunity, as merely a coincidence and nothing more.

DISCOVERY OF KCNS.

The information which we have relative to the source, occurrence, and action of KCNS in the saliva is very meager, and the opinions of various observers differ. Treviranus was the first to note the presence of this constituent in the saliva. He reported in 1814 that he had noticed a red color appearing in saliva to which a few drops of dilute $FeCl_3$ had been added. Some time later Gmelin and Tiedmann proved that this substance was KCNS.

QUANTITY OF KCNS IN THE SALIVA.

The amounts of KCNS which have been found in normal saliva by various physiologists have a wide range, some putting the normal amount as low as 0.00016 to 0.0084 per cent. and others as high as 0.041 per cent. Many salivas are known to contain no KCNS. Leared found KCNS in the blood and urine as well as in the saliva. Scheidlen and Munk, also, found it in the urine.

SOURCE OF KCNS IN THE SALIVA.

The source of KCNS is not definitely known. It is thought to be a product of proteid metabolism. Fenwick has investigated the variations of KCNS in the saliva, especially in its relation to the variations of the nutrition of the body under pathological conditions. He stated that the amount of KCNS bears a relation to the amount of sulfur in the bile, and that, when the bile is diverted from the alimentary canal, the KCNS disappears from the saliva. It is therefore quite probable that the amount of the KCNS in the saliva will vary with the amount of proteid ingested. It is obvious that this would not apply to individuals who have no KCNS in their saliva at any time. (Hammarsten.)

PHYSIOLOGICAL ACTION OF KCNS.

Very little is known as to the physiological action of KCNS, and small con-

sideration has been given to this question. Dr. Miller demonstrated that in the strength in which it occurred in the saliva, KCNS has no germicidal or restraining effect of any kind upon bacteria. If, then, it affects the growth of caries in any manner, it must be by its effect upon the food or growth material of the bacteria which produce caries. Dr. Waugh and his assistants have carried on extensive experiments, in which bacteriological plaques similar to those of caries have been grown on artificial media, with and without minute quantities of KCNS. In their report on this work they state that in nearly every case in which KCNS was added to the media, there was a marked restraint or complete absence of plaque formation. They draw the conclusion that KCNS in the saliva is inhibitory to plaque formation, and that its presence is conducive to immunity of the teeth to caries.

METHOD OF DETERMINING THE PRESENCE OR ABSENCE OF KCNS WITH FERRIC CHLORID.

In all of these investigations but one method has been used for determining the presence or absence of KCNS in the saliva—that of treating the solution to be tested with a few drops of dilute acidulated $FeCl_3$. The reaction produces a compound, ferric sulfocyanate, $Fe(CNS)_3$, which, in the undissociated condition, has a deep reddish-brown color. This is a very delicate test. It is used extensively, in the reverse manner, for the detection of minute quantities of trivalent iron; the reaction, in case KCNS is added to a solution containing ferric ion, is definite and positive. Further, this test becomes more distinct, if the liquid is shaken with ether. Ferric sulfocyanate, in the undissociated state, is soluble in ether; the undissociated portion, therefore, passes for the greater part into the ether, a fresh amount of the undissociated compound is formed in the aqueous solution, and this also goes into the ether. When the equilibrium is finally established, there is much more undissociated ferric sulfocyanate in the ether than there was in the water solution. As a consequence, the sensitiveness of the reaction is correspondingly enhanced. However, alkali fluorids, sodium acetate, sodium sulfate, or mercuric salts, may obscure the test. (Boettger.)

DRAWBACKS OF THE FERRIC CHLORID TEST FOR KCNS.

In making the ferric chlorid test for KCNS we are using a reaction which, although it is extremely delicate in water and still more delicate in an ether solution, yet may be entirely obscured by other substances occurring in the same solution with it. In making this test in saliva, we are dealing with a complex biochemical solution containing substances which may alter the reaction. Further, it is possible that there may be present in the saliva some substance, other than KCNS, which is capable of giving a red color with $FeCl_3$. For example, diacetic acid, an intermediary end-product of metabolism, will react with $FeCl_3$, giving a red color similar to that of $Fe(CNS)_3$. Should this be present in the saliva, the KCNS reaction may be obtained while KCNS is really absent. This phase of the problem has been investigated in this laboratory, for the purpose of determining whether or not the ferric chlorid test for KCNS in the saliva is reliable. To this end a number of salivas which reacted to ferric chlorid were obtained, and an attempt was made to prove that the substance which reacted was, in all cases, KCNS.

EXPERIMENTS AS TO THE RELIABILITY OF THE FERRIC CHLORID TEST FOR KCNS.

For this purpose a series of twelve salivas was collected. Samples of each were tested for KCNS with ferric chlorid in the usual manner, and accurate titrations were made with standard silver nitrate solution to determine the percentage of KCNS present in each. Two 5 ccm. samples were taken for each case, and placed in 25 ccm. Erlenmeyer

flasks, provided with rubber stoppers and glass outlets. For the control, 0.1 ccm. of $n/100$ KCNS solution was added to one flask of each pair. In order to have concentrated solutions for the test, the 24 flasks were placed in a steam-bath and the glass tubes were connected with a vacuum pump to facilitate the evaporation by reducing the pressure. This precaution was taken to minimize the chances for alteration in the saliva. After each sample was thoroughly dried in this manner, the residue was stirred with one drop of water and one or two drops of $FeCl_3$ solution. Then 5 ccm. of ether was added.

The controls in all cases showed a bright red color with ether. The color can be best seen by observing through a thick layer of ether solution on holding the flask level with the eye. The test samples were notably different from the controls. As the tabulated results show, the test in ether does not correspond in all cases with the ordinary test:

	Water Solution.		*Ether Solution.*	
No.	Color.	Per cent.	Test.	Control.
1	Light red	0.0036	+	+
2	Straw	0.0016	—	+
3	Straw	0.0007	—	+
4	Light red	0.0035	—	+
5	Dark lemon	0.0021	—	+
6	Amber red	0.0046	Faint	+
7	Dark red	0.0051	+	+
8	Dark lemon	0.0032	Trace	+
9	Dark lemon	0.0026	Trace	+
10	Lemon	0.0009	—	+
11	Red	0.0043	Faint	+
12	Light red	0.0034	Faint	+

From these results we see that the colors obtained by $FeCl_3$ in the aqueous solution represent percentages ranging from 0.0007 to 0.005. Of these, Nos. 2, 3, and 10 gave the lightest color, which was straw to lemon. The ether test showed complete absence of color for these cases. Nos. 5 and 9 were the next in intensity, being dark lemon but without a distinct red color. In ether, No. 5 was negative, while No. 9 gave a slight color or reddish tinge. Next in strength of reaction were Nos. 1, 4, 8, and 12, ranging from dark lemon with reddish tinge to a light red color. In ether, No. 1 gave a positive red color, with a good reaction, while the other three were negative or very faint in their reaction. Finally, the strongest reactions were seen in Nos. 6, 7, and 11, which had a color of amber, or dark red. Of these, No. 7 was positive, while Nos. 6 and 11 were very faint or negative.

From these results, a wide discrepancy in the two methods is obvious. Of the five cases giving weak or doubtful tests in water, but one gave any test in ether. It must be remembered that ferric sulfocyanate shows a much more delicate color test in ether than in water, so that KCNS, if present at all, should be discernible in the ether solution. Of the remaining seven, which gave a positive, distinctly red color reaction, there were but two that gave a like reaction in ether. These two were distinctly red in their reaction and more pronounced than in the water solution. The remaining five gave a negative or very faint reaction.

The question naturally arises at this point as to whether the difference between the two methods might be due to the fact that there was such a chemical combination or conjugation of the KCNS in the saliva that the ether would not have detected it if present; or that, in the process of drying the saliva, the KCNS had been destroyed or driven off. The latter of these considerations was answered by the controls, consisting of like samples of each case, with a definite but small amount of KCNS added; these were put through exactly the same process simultaneously with the sample to be tested. In every case the control gave a distinct reaction—light for those which were negative in ether, and correspondingly heavier for the positive cases. As regards the former it might be said that the existence of a conjugate form of $Fe(CNS)_3$, which is insoluble in ether, is hardly conceivable. Therefore, the KCNS in each sample would have been demonstrable, had it been present, and was not lost in the presence of exchanging the solvent.

THE FERRIC CHLORID TEST NOT A POSITIVE ONE FOR KCNS IN THE SALIVA IN WATER SOLUTION.

From this we are led to the conclusion that *there must be something in the saliva, other than the KCNS, which will react with* $FeCl_3$, and it follows that $FeCl_3$ *cannot be considered a positive test for KCNS in the saliva in a water solution.* Unless the results of these experiments can be disproved, the statistics on salivary analysis, as far as the amount of KCNS is concerned, are valueless.

QUESTION OF THE PRESENCE OF DIACETIC ACID IN THE SALIVA.

It is not easy to determine the identity of the constituent of saliva which gives the reaction with $FeCl_3$ in water and not in ether. Diacetic acid answers many of the requirements of that reaction, in that it reacts with $FeCl_3$ in water solutions, but the resultant compound is not soluble in ether. It is possible that diacetic acid may be present in some salivas, giving a reaction with $FeCl_3$, which might be mistaken for a KCNS test.

Some experimentation was carried on along the line of attempted artificial production of diacetic acid in the saliva, and its detection with $FeCl_3$. This was done by feeding diacetic acid to patients who had a saliva which was negative to $FeCl_3$. The diacetic acid was fed in the form of capsules containing 1 ccm. doses of diacetic ether and beta-oxybutyric acid. This experiment produced varying results, but in two cases there was a marked reaction with $FeCl_3$ in about half an hour after the administration of 1 ccm. of beta-oxybutyric acid. Beta-oxybutyric acid does not react with $FeCl_3$, so that, in order for it to produce a reaction it must have been partially oxidized to form the intermediary product of metabolism, diacetic acid, which, if present in the saliva, would have given the $FeCl_3$ test. Diacetic ether and beta-oxybutyric acid were fed to several patients without any indication of diacetic acid in the saliva. In these cases it is likely that the metabolism was so complete that only end-products were formed, and were eliminated as such.

The salivas of several diabetic patients who had been excreting diacetic acid in their urine were examined, and in every case a $FeCl_3$ test was positive in water and negative in ether. Should KCNS have been present in these cases, it would have reacted in both water and ether solutions.

TESTS AFTER FEEDING KCNS PILLS.

In addition to these, several cases, whose salivas were negative to $FeCl_3$, were fed KCNS pills. Tests were made every five minutes, and in a number of cases the drug was discernible by tests in both water and ether solutions in from twenty to thirty minutes.

THE FERRIC CHLORID TEST FOR KCNS ONLY NEGATIVE. NECESSITY OF TEST WITH ETHER SOLUTIONS.

From the foregoing I am led to believe that in the investigation of the inhibitive action of the KCNS in the saliva the character and efficiency of the diagnostic test must be taken into account. As to the results which have been obtained by the use of $FeCl_3$ as a reagent in the ordinary water solution, those salivas which have given no reaction are doubtless negative in KCNS, but of those which were positive in their reaction with $FeCl_3$ it is probable that a large per cent. contained little or no KCNS. So that $FeCl_3$, in water solutions, can give only a negative test for KCNS in the saliva, and cannot be relied upon for a positive reaction unless verified by transferring the test to an ether solution. If, then, it is desired to conduct an accurate investigation of the KCNS content of the saliva, the method outlined above may be made use of to definitely demonstrate the presence or absence of the constituent; more than this it will not do, as it is impracticable to conduct an accurate titration in ether solutions, on account of the nature of the solvent. It is possible to titrate by separating the colored etherial solution, then allowing

the ether to evaporate, and taking up the residue with water.

THE AUTHOR'S MODIFICATION OF THE FERRIC CHLORID TEST FOR KCNS IN SALIVA IN ETHER SOLUTION.

It will be necessary to make modifications of this method to suit the convenience of the investigator. The most simple method is as follows: Pour 5 ccm. of saliva into a thin curved watch-crystal of about three inches in diameter. Allow this to stand in the air or sunlight, or better still, set it on a slowly steaming water-bath, until the saliva has dried to the dish. To this add one or two drops of water and one or two drops of $FeCl_3$, and stir with the residue to make a thick paste. To this add 5 ccm. of ether, and stir the paste thoroughly. When well mixed, hold the glass on a level with the eye and note the color of the solution.

Not only is this test useful for KCNS, but it also opens up the way for a great deal of valuable work which may be done upon the presence of diacetic acid in the saliva. Much investigation of this kind should be carried on, and correlation be made with the urinary analysis and the general health of the individual.

The author is indebted to Professor Novy of the medical, and Professor Smeaton of the chemical department of the University of Michigan for valuable suggestions and assistance rendered in connection with this work.

PUBLIC DENTAL HYGIENE: AN ADDRESS TO THE DENTAL PROFESSION OF AMERICA.

By Dr. ALBIN LENHARDTSON, Stockholm, Sweden,
SECRETARY OF THE HYGIENE COMMISSION OF THE FÉDÉRATION DENTAIRE INTERNATIONALE.

INTEREST in public dental hygiene has of late taken a more and more concrete form, not only among us dentists but also among the public. At the Fifth International Dental Congress, held in Berlin last summer, a "Permanent International Committee for Public Oral Hygiene" was appointed. Prof. Dr. Ernst Jessen, Strassburg, was chosen president, and Albin Lenhardtson, Stockholm, secretary. Twenty national committees were formed, whose duty it is to further the objects of the International Committee. The committee was accepted as an extension of its Hygienic Commission by the Fédération Dentaire Internationale. King Gustaf of Sweden afterward undertook the patronage of this committee.

One of its first aims is the establishment of municipal dental school-clinics. They are an important aid in the prevention and extirpation of diseases of infection, particularly of tuberculosis. The municipal dental school-clinic has therefore a double function to fulfil: In the first place, it is to be regarded as an agent of defense in the struggle against tuberculosis; and in the second place, as a means of education in cleanliness, and hence the most effective protection against every sort of infection. The school dentist should be a public sanitarian—the teacher and adviser of both parents and children. The expenses entailed by the establishment of school dental clinics are insignificant in comparison with those incurred in the campaign against tuberculosis. The question of public oral hygiene is assuredly of international significance. It constitutes, like all great questions of human advancement, a bridge of mutual understanding between the nations.

The Hygiene Commission of the F. D. I. will work as the central organ. By means of advice, proposals, addresses, and lectures, we shall help the national associations in their work, as has been done in Sweden, Germany, Denmark, Finland, and Holland, where associations are already started. We wish in return to receive annual reports of work done by the national committees, and suggestions of all kinds. Thus a very beneficial reciprocal action will result.

When organizing public dental hygiene work it is necessary that we be fully conscious of our responsibility. We must build on a solid basis, not only for our own time but for all coming generations. If well done, posterity will bless us; if badly, it can justly accuse us. As I do not wish to be tedious, I will only point out some of the advantages of this international collaboration. Such questions as the regulation of the dental service in schools, penal institutions, state asylums, hospitals, and the army, can only gain by exhaustive analysis. Furthermore, we have other questions, as centralization or decentralization of the school clinics in greater towns; the relation of the dental clinic to the problem of assimilation; the resistance against infectious diseases, especially tuberculosis. Should all or only extremely poor children in the common schools have treatment gratis? Should poor children in the higher schools have dental service? In addition there are many practical questions, such as producing good and cheap tooth-brushes for school children and the army, furnishing cheap material for the clinics, etc. Such matters can be best solved through international co-operation.

This co-operation between the different national associations and the Hygiene Commission of the F. D. I. will probably take place in the following manner: The question as to how many teeth a conscript ought to have for approval is propounded, say, in a country. This query is sent to the board of the Hygiene Commission, F. D. I., which will have it printed in English, French, and German, for circulation to the different national associations. If the question is of great importance and cannot be solved in this way, it may be discussed at the next general meeting of the commission.

For systematizing this plan the first step, of course, is to *organize national associations* in the different countries. In some countries such associations already exist. The boards of these associations consist of many eminent government officials, hygienists, pedagogs, and dentists. The attention of the various nations is directed to this point. The authorities as well as the people expect that we dentists shall effectually intervene in order to carry this important national question to a successful issue. This is quite natural considering that caries is the most common of all diseases, and that neglected mouth hygiene predisposes to various disorders in the human organism.

The leading objects of the national committees are—

(1) The education of the teachers, the authorities, and the public, through lectures, pamphlets, and illustrated material, as to the importance of mouth hygiene.

(2) The education of school dentists.

(3) The collection of material for demonstrating the necessity of school clinics and persuading the authorities of their importance.

(4) The arrangement of all kinds of dental clinics.

(5) The determination of the salary of the dentists, in order to avoid a dental proletariat.

(6) The procuring of tooth-brushes which can be manufactured in quantity at a low price and of good quality; also of educational material, including pictures and lantern slides.

(7) The using of influence in order that qualified dentists may be selected to confer with the authorities in affairs concerning oral hygiene. The present importance of the subject makes this of the greatest moment.

In the United States the teeth of the soldiers now receive treatment. The Swedish Medical Board says: "This question is of very great social hygienic importance; in our opinion, which is also that of the Swedish Dental Association, *oral hygiene ought to be established in the schools rather than be deferred to the army.* Treatment which will be productive of the best results must be prophylactic; the process of decay, as statistics plainly prove, is rather far advanced when the young men enter the army."

In Europe we lay the greatest stress on educational measures and dental clinics for children; military dental clinics stand second. In Sweden there are four dentists who give lectures upon mouth hygiene. One of them has, up to the present time, given about one hundred and thirty lectures in all parts of Sweden. We have to date thirty clinics in schools and asylums; in Germany they have about fifty.

This movement has now arrived at such vast proportions that it will be impossible to solve it in a proper manner without the co-operation of the public. We therefore find it necessary to interest eminent men outside our profession. This attempt has been approved by the Fédération Dentaire Internationale.

The Board of the Hygiene Commission, F. D. I., wishes you every success in your work.

ORTHODONTIA AND ORTHOPEDIA OF THE FACE, AND THE INFLUENCE OF EXPANSION OF THE DENTAL ARCHES IN ESTABLISHING NORMAL RESPIRATION.

By VICTOR HUGO JACKSON, M.D., D.D.S., New York, N. Y.

(Read before Section I of the National Dental Association, Denver, Colo., July 19, 1910.)

IN 1887, 1900, 1907, and 1909, the writer called attention to the importance of expanding the dental arches for the purpose of increasing the lumen of the nares to improve breathing. From 1887 to the present time, he has continued to note the results of treatment in the many cases that have come under his observation.

EXPANSION OF THE UPPER DENTAL ARCH.

Before discussing this subject, it seems advisable to first consider the general plan followed in expanding the upper dental arch.

When the teeth are irregular, they are usually very much crowded in the arch. This is most generally evidenced by there being insufficient space between the canines for the proper arrangement of the four incisors.

In expanding the arch laterally, the anchorage should always include the canines with the bicuspids and molars, as, when expansion of the arch is required, generally more space is needed between the canines for the correction of malposed incisors. The necessity of moving the canines outward with the bicuspids and molars is made the more apparent by considering the lines of force.

Of the many cases requiring lateral expansion of the dental arch to improve the occlusion of the teeth, not more than from fifteen to twenty per cent. require expansion of the distal part of the arch.

In making a regulating appliance,

where only the anterior part of the upper arch needs lateral expansion, a base wire, No. 10 or 9 U. S. standard wire gage, known as the palato-distal base wire, is arranged to cross the distal part of the arch where it is broad enough.* The palato-distal base wire is always shaped to follow the palatal curve of the arch, with the ends bent forward, forming arms to rest on partial clasps arranged on the lingual side of the molars, bicuspids, and canines. The ends of the arms are tapered to make them less bulky. The arms are the foundation of the anchorage portions of an appliance; they are soldered to the partial clasps with the ends of spring clasps and finger springs.

ANALOGY OF APPLIANCES USED WITH THE HUMAN BODY.

To impress upon the mind of the many features of the appliances to be presented, I might here point out the analogy and compare with the human body the removable regulating appliances as described in this paper.

The base wire is the foundation or body of a regulating appliance; it is made of large spring wire. The portion of the base wire connecting the lateral divisions of an appliance is always large and strong; the ends are bent to project forward or backward, like arms. The arms are shaped to rest on partial clasps on the lingual side of the anchorage teeth.

The base wire is like the human body with the arms extending forward from the shoulders, which are represented by the arms of the base wire extending forward. There are fingers on the ends of our arms, and likewise there are metal fingers attached to the ends of the metal arms of an appliance.

The essentials of a regulating appliance are a strong body, strong arms, and strong fingers, as each have to do definite work. They should be large and strong enough to move the teeth a definite distance in a given time, and not move the teeth farther than is intended. If a man is not strong enough to accomplish the work laid out for him, a stronger man is employed. We would deal with this matter in the same way; in making a regulating appliance, always having it built strong enough to cause the arms and fingers to act definitely in making the desired movement of the teeth and process.

Again, the human body performs all movement by muscular action; this, in effect, is similar to the action of a metal spring. The human fingers and arms grasp objects and move them definite distances with ease, following the command of the will. The plan of this system of regulating is to have an appliance built sufficiently strong and so thoroughly anchored as to move the teeth a definite distance in the desired direction in a limited time.

The analogy mentioned will be apparent in the study of all the appliances presented, making some of the details in their description more readily understood.

In designing an apparatus for moving the teeth, one would generally be led to adopt correct forms of metal arms and fingers by first shaping his finger as he would to move a similar object.

ORTHODONTIA AS AN EXACT SCIENCE.

Orthodontia and orthopedia of the face have been recognized as a science, but it is desirable that the different phases of orthodontia be reduced to an "exact science"—that the mechanics be so simplified that any operator of steady judgment can perform at least ordinary operations without overtaxing his mechanical skill.

It is understood that the teeth can be successfully regulated by any method employed in practice, but less time should be required in making and adjusting appliances, in the attendance of cases, and the regulating should be completed by a smaller number of visits, and no pain or special discomfort should be caused to the patients.

* Jackson, "Orthodontia," 1904. ("Expansion of the Dental Arch.")

RECORD CARD.

To accomplish this, several years ago the author devised a method* of making a careful pencil tracing of the appliance on a "record card" before the adjustment of the appliance. The careful use of a tracing in applying force, with the appliances here recommended, taking definite short steps at intervals of one week, makes the movement of the bone and teeth painless, as is borne out by experience.† The appliance is made on an accurate model. It is removed from the model and carefully adjusted to the patient's teeth; then the appliance is placed on a record card, and a careful pencil tracing is made of the outlines of the appliance, especially of the partial clasps and finger springs.

When force is to be caused on the teeth by any parts or springs of the appliance, as for expanding the arch laterally or moving incisors, a pencil dot mark should be placed by the side of the tracing, at the distance and in the direction it is intended to bend the springs or arms of the appliance for causing force, and the spring is bent a corresponding distance. For the first and any subsequent applications of force, the change should be one millimeter or less, seldom more.

The card is ruled from above downward. The date of the change in the appliance is made to agree with the new tracing, and is inserted in a column at the right. A light line is drawn from the date to the dot mark, which completes the record of the change that is made. Every subsequent change in the shape of the appliance is recorded by one or more dot marks as required, and the date is noted in the column in the same manner, with a line connecting them. If a change be made in two or more springs on the same date, the lines extending from the dot marks to the date should converge.

All changes in the form of an appliance for causing force should be indicated by dot marks; the dot marks corresponding with the new changes, and therefore being successive; the spaces between the dot marks are known as "steps."

The visits for changing the force are made at intervals of one a week. Later, if desirable, the visits may be made once in two weeks or more.

By using a pencil tracing of the appliance in this manner on a card, the card then being filed, a permanent record is kept of each change made in the appliance, the date, and also the distance the teeth have been moved.

With an appliance made as described there should be no pressure caused on the gum tissues; by following the plan of the record card—that is, indicating only short distances or steps by the dot marks—and by leaving an interval of seven days between visits, the patient can be assured that there will be no pain or special discomfort in the regulation of the teeth.

Generally, only a few definite steps by the tracing, and corresponding changes in the appliance, are required in order to move the teeth as far as desired.

DEVICE FOR LATERAL EXPANSION OF ANTERIOR PART OF ARCH.

The force needed for the lateral expansion of the arch, with an appliance having a palato-distal base wire, is caused by grasping with the fingers the ends of the arms and pulling outward on them until the base wire is bent sufficiently to cause the ends of the arms to rest with the new dot marks of the tracing. Changes in the shape of the appliance should never be made by guess, but always by the tracing.

DEVICE FOR LATERAL EXPANSION OF ANTERIOR AND DISTAL PART OF UPPER ARCH.

This device consists in a palatal base wire for expanding laterally both the anterior and the distal part of the upper arch. The appliance is made by first forming a large base wire to cross the distal part of the arch, following the palatal curve, with the arms free and shaped to extend forward to the canines,

* Jackson, "Orthodontia," 1904, p. 113.

† Rodgers, Cosmos 1907, p. 1288.

where each is bent in a short curve to extend backward to the last molar. The latter portion of the arms is shaped to rest on partial clasps arranged on the lingual side of the canines, bicuspids, and molars, thus forming a body for the anchorage portions of the appliance.

Finger springs for any purpose can be attached to the arms or anchorage of the appliance.

It will be seen that the management of this form of an appliance for expanding the anterior part of the arch is the same in principle as the one previously described—that is, by following the plan of the tracing and grasping with the fingers the anchorage portions and pulling outward, bending the base wire until the arms agree with the new tracing in the anterior part.

When the distal part of the arch is to be expanded, dot marks on the tracing are made opposite the arms, and the arms are pulled outward with the fingers until they agree with the new tracing, which bends the base wire thus [shown].

With this arrangement the base wire of the appliance can be adjusted for expanding laterally either the distal or the front part of the arch, or both, with exactness and in a few moments.

DEVICE FOR LATERAL EXPANSION OF WHOLE UPPER ARCH.

This appliance represents a different form of palatal base wire for expanding laterally the whole upper arch. It is suitable for most cases requiring ordinary lateral expansion, especially when a lesser degree of expansion is required.

The base wire curves backward, following the deeper portion of the palatal vault, extending to the last molar on either side, where it is bent forward, forming arms, to rest on partial clasps arranged on the lingual side of the anchorage teeth, to which they are soldered with the ends of spring clasps and finger springs, the arms strengthening the anchorage portions of the appliance.

With this arrangement of the base wire the appliance is not quite so bulky as the one already described, which has curves in the wire opposite the first bicuspids, necessarily taking up some space. But the base wire in either form does not cause discomfort or interfere with speech.

Springs for any purpose can be added to the anchorage portions. For expanding the front part of the arch, the arms are pressed outward, bending the base wire. In expanding the distal part of the arch, pressure is caused which bends the base wire thus [shown].

DEVICE FOR LATERAL EXPANSION OF LOWER ARCH.

This appliance consists of a lingual base wire for expanding laterally the lower arch. The base wire is of the same general form as the one previously shown for expanding the upper arch. It is shaped to follow the lingual curve of the arch, resting below the margin of the gum, extending to the last molars, where the ends are bent forward, forming arms to rest on partial clasps arranged on the lingual side of the anchorage teeth, to which they are soldered with the spring clasps and finger springs.

When the arch, either upper or lower, needs only a little expansion, generally no especial anchorage to the canines other than the resting of the appliance on their lingual surface is required. When more expansion of the arch is needed, a stronger anchorage is generally employed. A collar with a lingual lug is cemented to each of the canines to sustain a wire finger extending forward from each of the arms of the appliance.

"V-SHAPED" NARROW UPPER ARCH.

In V-shaped narrow upper arches extreme upper protrusion is typical.

The roof of the mouth is the floor of the nose. Changes in the shape of the palate processes of the maxilla and of the intermaxillary bone change the floor of the nose. When the dental arch is narrower than it should be, and the incisors are prominent, the intermaxillary bone generally has a greater than normal antero-posterior measurement. The change in the shape of the intermaxillary

bone is indicated by the change in the anterior curve of the arch and by the line of the intermaxillary suture.

DIVIDING THE ARCH INTO SECTIONS.

When the arch is expanded laterally and the incisors are forced inward, the lateral measurement of the intermaxillary bone is increased, and the antero-posterior measurement is lessened.

In the study of the dental arch for the purpose of correcting irregularities of the teeth, increasing the lumen of the nares, or other purpose, it is an advantage to divide the arch into three divisions, sections, or segments—two lateral maxillary divisions and one intermaxillary division. These divisions of the upper arch have natural borders, these being separated by the lines of the sutures. The divisions are—*Right maxillary division,* which contains the molars, bicuspids, and canine, on the right side of the arch. *Left maxillary division,* which contains the molars, bicuspids, and canine on the left side of the arch. *Intermaxillary division,* which contains the four incisors. These divisions can be symbolized as follows: R–M–D, L–M–D, I–M–D.

For convenience, the lower arch should be divided into similar divisions.

NASAL STENOSIS.

Over thirty per cent. of children suffer with nasal stenosis. Of these stenoses a large percentage are caused by lack of normal nasal capacity, due to bony constriction of the dental arch from arrest or lack of development.

When the conditions will not permit normal nasal breathing, the arches will not develop normally.

If the upper arch does not develop laterally as much as it normally should, the palatal processes and the intermaxillary bone usually become thickened, and often arch higher than they should.

To improve the breathing, the conditions are treated by the rhinologist by removing adenoid growths, polypi, or thickened membranes, reducing congestion, correcting improper cartilaginous development, any deviation of the septum, and when necessary excising more or less of the turbinated bones.

When by these changes nasal space is not sufficiently increased to establish normal breathing a chisel with a mallet is sometimes employed by the rhinologist for removing the maxillary ridges of the floor of the nose, or the thickened portions generally found by the side of the septum.

After careful treatment as noted, it is often found that the conditions have not been sufficiently benefited to permit normal breathing, and the patient continues to breathe through the mouth.

INDICATIONS FOR INCREASING THE NARIAL OPENINGS.

This and other experiences encourage the orthopedist to expand the arch in a manner that will enlarge the nares sufficiently to permit normal breathing.

In any case where arrest of development of either the upper or the lower arch of a young patient is suspected, the orthopedist should make an examination in order to determine whether the breathing is normal and whether there is sufficient room in the arch for the proper complement of teeth. If there be insufficient space for the teeth, or deficient nasal space, the arch should be expanded early, or before development at the sutures connecting the divisions of the arch becomes inactive. In the case of a child with deciduous teeth, if the interproximal spaces between the incisors and the incisors and canines should not gradually increase by the natural lateral growth of the bone and process, in order to provide for the eruption of the permanent incisors, early lateral expansion of the arch should be resorted to.

It will be observed that the deciduous incisors are always much narrower than the permanent incisors, but generally the latter gradually wedge their way into the arch, causing its expansion.

It will also be noted that the condition is different in the intermaxillary division of the arch as referred to than

in the lateral maxillary divisions, as with the latter the deciduous teeth are usually broader than the permanent ones that are to occupy their place. This increase of space is more apparent with the teeth of the lower than with the upper arch. The laws governing these conditions should be kept constantly in mind in the study of the development of either the upper or lower arches.

In case there is not sufficient room in the arch for the normal eruption of the permanent teeth, the orthopedist should expand the arch in a manner that will encourage progressive natural development of both the dental arch proper and the lateral walls of the nose. The dental arch in these cases generally requires both lateral and anterior expansion.

The proper lateral expansion of the upper dental arch, especially in young patients while in their developmental stage, increases the narial openings and improves the breathing.

The writer, in studying the natural arrangement of the bones of the face, conceived the idea of increasing the nares to favor free breathing by moving the teeth bodily in expanding the upper arch.

The expansion is accomplished by grasping the crowns of some or all the anchorage teeth and moving them bodily outward with the alveolar process and true bone.

METHOD OF EXPANDING THE DENTAL ARCHES TO INCREASE CAPACITY OF THE NARES.

The principal object in preparing this paper was to describe a method for expanding the dental arches in a manner that would increase the capacity of the nares to improve the breathing. Several methods have been devised by the writer. For lack of time but one method will be mentioned here; others are prepared for a later paper.

IMPROVED ANCHORAGE.

An improved method of anchoring an apparatus to the teeth for the expansion of the arch, moving the teeth bodily, and for other purposes, consists in first cementing to each of the upper and lower canines a thin broad collar with a buccal lug or tube, located to rest near the gum; similar broad collars with disto-buccal lugs or tubes, arranged to rest near the gum, are cemented to each of the distal molars of the arch.

To the anterior part of the arms of an appliance made as described is attached a wire clasp, one on each side of the arch. The wire clasp is arranged to rest at the junction of the canine and lateral incisor, resting well in the groove, and to extend over the arch to the gum line, where it is bent backward and downward in a curve to engage with a lug on the collar cemented to the canine. The end of the clasp is curved forward on itself, forming a hook. Similar wire clasps are attached to the distal part of the appliance, one on each side, the clasps being shaped to pass around the last molars of the arch, and rest above the lugs on the collars.

The wire clasps and lugs on the collars are known as the locking device of the appliance.

With this form of anchorage, the appliance can be detached from the teeth only by unlocking the wire clasps from the lugs on the collars, which the patient easily does in a moment by the finger. With this arrangement of anchorage there is nothing to interfere with any desired change in the correction of the occlusion of the teeth or for any other purpose. If any parts of the appliance should become bent and interfere with the occlusion, they can be readily corrected by re-shaping the springs.

Force for expanding the arch laterally is gained by removing the appliance from the teeth and pressing outward with the fingers on the ends of the arms sufficiently to bend the base wire a little at a time, and reinserting the appliance. The spring of the base wire produces lateral force outward on the sides of the arch, causing its gradual expansion.

Additional applications of force are usually made but once a week or at longer intervals, the object being to cause slight

continued force upon the teeth, keeping up their steady progressive movement in one direction, in that manner stimulating the natural development of the maxillary processes and intermaxillary bone at the sutures and other parts. These bones are numbered with the flat bones, which are increased by development at their edges.

It will be observed that the roots of the deciduous and of the permanent canines project well up to, and sometimes within the outer bony walls of the nose. The upper third of the roots of the molars, bicuspids, and canines are surrounded by true bone.

In any case where the greatest benefit to the conditions of the nose from expansion of the jaw is desired, the lateral maxillary divisions of the arch, or columns of teeth with their roots, should be moved outward bodily. This bodily movement of the teeth with the process and bone proper, if produced gradually, exerts a definite influence in the lateral expansion of the nares.

DEVICE FOR MOVING TEETH OUTWARD BODILY.

The moving of these teeth bodily, even though it be difficult, is accomplished in a simple and painless manner by first cementing to the canines, on each side of the upper arch, a broad collar as described, having a lug on the buccal surface located to rest near the gum, and a lug on the lingual side of the collar at the gum line; also a similar collar, with a lingual and a disto-buccal lug located near the gum, should be cemented to each of the distal molars, one on each side of the arch, as previously described. Each of the teeth that are to be moved bodily outward requires that a broad collar be cemented to it, having a lingual lug located at the gum line and a slightly hook-shaped buccal lug located near the gum.

When, in addition to the anchorage to the canines and distal molars, other molars and the bicuspids are to be moved outward bodily, a small tube is soldered longitudinally on the buccal surface of the collar on the last molar, resting below the lug. A similar tube is soldered perpendicularly to the disto-buccal surface of the collar on the canine.

Through the tube on the molar passes a small wire, about No. 19 gage, known as a "sustaining bar," which extends forward, following the gum line to the canine, where the end is formed into a vertical loop shaped to enter the tube from below upward. To cause action, the sustaining bar is so adjusted as to spring downward to engage with the buccal lugs of the collars.

It will be noted that the lingual lugs on the collars are located at the gum line and the appliance arranged to rest upon them. Therefore, in making an upper appliance to move the teeth bodily in the lateral expansion of the arch, partial clasps are first shaped to the collars on the lingual side of the teeth to be moved, resting on the lingual lugs.

A palatal base wire with the ends bent forward forming arms, and wire clasps and other springs, are adjusted in place and soldered.

The appliance when adjusted rests on the lingual lugs, in effect pressing upward, while the wire clasps extending over the arch and the sustaining-bar passing above the buccal lugs in effect press downward; with this arrangement of the anchorage, the arms of the appliance when in action force bodily outward all of the teeth sustained by this form of anchorage.

When expanding the upper arch, the lower arch should always be expanded in the same manner, sufficiently to keep the arches equalized.

DEVICE FOR EXPANDING LOWER ARCH.

This appliance is designed for expanding the lower arch. It is made with wire clasps and when necessary a sustaining bar similar to the one described, and has a lingual base wire, No. 10 or 9, shaped to follow the lingual curve of the arch to the last molar, where the ends are bent in a short curve to extend forward, reaching to the canines, forming what are known as the arms of

the appliance. The arms give strength to the anchorage portions.

Force for expanding the anterior or distal part of the arch is caused by pressing outward on the mesial or distal ends of the arms, which bends the base wire; in doing this, one should always use a tracing.

SUSTAINING BAR FOR PREVENTION OF TIPPING.

When the arches are being equalized, usually it is necessary to expand laterally the anterior part of the upper arch to permit the lower arch and teeth to take a correct position. When continued force with rubber equalizing bands is applied to the lower and upper anchorage teeth in equalizing the arches antero-posteriorly, they are sometimes tipped forward in the line of the arch or tipped backward, either of which is undesirable. To prevent this, a sustaining bar is utilized by adjusting it in the tubes on the collars cemented to the anchorage teeth, as described under moving the teeth bodily.

When the bar is applied in the tubes, it will not permit the teeth to be tipped forward or backward in their sockets without the wire is first bent for that purpose; in the same manner, the device is utilized for righting teeth that have become tipped in the arch at any stage of their regulation, by bending the ends of the bar correctly and re-inserting it in the tubes.

The bar is used for sustaining other molars and bicuspids, for moving them bodily, and when necessary, for elevating them. It is equally practical for sustaining the teeth of the lower arch.

PROCEEDINGS OF SOCIETIES.

NATIONAL DENTAL ASSOCIATION.

Fourteenth Annual Meeting, Denver, Colo., July 19, 20, 21, and 22, 1910.

SECTION I: Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

Chairman—GEO. H. WILSON, Cleveland, Ohio.
Secretary—B. FRANK GRAY, Los Angeles, Cal.

(Continued from page 1249.)

THURSDAY—*Second Session.*

The section was called to order by the chairman, Dr. George H. Wilson, at 10.30 A.M., on Thursday, July 21st.

Dr. V. H. JACKSON, New York, N. Y., was first introduced and read a paper entitled "Orthodontia and Orthopedia of the Face, and the Influence of Expansion of the Dental Arches in Establishing Normal Respiration."

[This paper is printed in full at page 1353 of the present issue of the COSMOS.]

Discussion.

Dr. A. H. KETCHAM, Denver, Colo. This paper of Dr. Jackson's is very interesting, and upon the general principles therein outlined we can all agree. I think, however, it would have been better had the title of the paper been "A Method of Expansion of the Dental Arches, to Aid in Establishing Normal Respiration."

The essayist has mentioned that since 1887 he has been calling attention to the improvement in breathing which follows the expansion of the upper arch, and I believe that an improvement in breathing follows expansion in practically all cases where we expand the maxillary. It would be very interesting, indeed, if the essayist would specify the publications in which we can find his first mention of the expansion of the arch to improve the nares. I for one wanted to look it up and become familiar with the early writings on that topic.

The essayist stated that the majority of cases do not require expansion in the region of the molars. To my mind, it is a question as to whether it is the majority or the minority of cases which do not require expansion. We cannot determine that without careful measurements in an overwhelming number of cases reaching into the thousands.

As to the Jackson regulating appliance, there is no question that Dr. Jackson can do all he claims with his appliance, and do it painlessly. To my mind the effectiveness and the use of an appliance without pain and discomfort to the patient depends largely upon the skill and good judgment of the operator. We can take any appliance and so adjust it as to cause pain, if we do not apply it with the utmost care and skill, which of course come with practice. Still, some men who are practicing orthodontia, while they can treat their cases success-

fully from the standpoint of practical results, never seem to possess that intimate sympathy with child nature and that nicety and good judgment which show them the maximum pressure to be used in each case, so that they can treat these cases painlessly. The majority of orthodontists, however, can secure a beautiful result painlessly with the expansion arch.

The essayist says that orthodontia is an exact science, and that the appliance should be used with the tracing. In my opinion, the amount of expansion depends upon the operator's judgment, even when he is using the tracing. Of course, with the tracing he knows how much pressure he is applying each time. Some children will be happy and comfortable with a pressure which would cause other children to complain. Dr. Jackson advises never to bend the appliance more than one millimeter. I believe that is correct.

Dr. Hawley has a set of charts showing the size of normal adult dental arches —which he has designed from careful measurements of the incisors, and he therefore approaches exact science much more closely than an operator who depends on his own judgment.

Of course we observe the long narrow teeth and long narrow dental arches; also the short broad type of teeth, with the skull and face also broad. In these short and broad heads, a short broad arch is required to be in harmony with the rest of the features. In the long narrow head, the long narrow arch is required to go with the long narrow incisors. Nature has given us the broader bicuspids and molars from the mesio-distal measurements to go with the long narrow incisors to make the long narrow arch. Even Dr. Hawley's measurements are not quite exact science, but they approach it more closely than the individual judgment of the operator.

Yesterday a member who came to my clinic told me that he was constantly prone to get the molars too far out buccally. I told him that he bent the ends of the arch out too much. He informed me that he "was not using the arch, but was using a Jackson appliance." I told him, then, that it was because he did not know how to use the appliance—because if any be used, of whatever type, it is not necessary to obtain too much expansion, if sufficient experience has been had in orthodontia to know how to adjust an appliance.

In using the arch, the patient needs to present but once a week, and some patients but once in two weeks. Furthermore, the arch cannot be easily removed by the patient, or bent and gotten out of adjustment, as it is possible to do with a removable appliance. The point has been made that the removable appliance is cleaner than the fixed appliance, but my experience has been that with the fixed appliance the patients' mouths are kept cleaner than they ever have been before, simply because more attention is paid to oral hygiene, and at each visit the mouth is carefully cleaned and sprayed, the teeth polished with pumice, if necessary, and everything is done to impress upon the patient's mind that a clean oral condition must be maintained.

From careful reading of Dr. Jackson's paper, I could not be certain whether he thought nasal stenosis preceded the constricted dental arch or was a condition following it. Of course we know in the case of a child suffering with a slight cold, having the "snuffles," that the mucous membrane of the nose becomes thickened, the adenoid tissue becomes enlarged, and nasal stenosis often results. When this occurs, as it usually does early in life, the growth of the bony part is interfered with. [Dr. Ketcham here showed slides of cases illustrated in September 1910 Cosmos, pages 956 to 960, Figs. 1 to 12.]

Sometimes orthodontists have made the statement, and rhinologists as well, that the floor of the nose is lowered by the operation of expanding the arch. That has been questioned, for we know that in its development the whole face grows downward or forward, the nasal space and the dental arch increasing in size. We also know that the roof of the mouth is higher, sometimes, in relation to the occlusal surfaces of the teeth than

it was before the treatment. The reason therefor is that we have stimulated growth in the alveolar process and in the bone above, and have helped to bring everything out and down, assisting nature.

It is possible to have nasal stenosis follow a constricted dental arch, but it would not be due, in that case, to adenoids. For instance, the lack of development of the upper arch may be due to the early loss of some of the teeth, either deciduous or permanent, and to disuse, in consequence of which the arch does not develop normally, and the nasal bones do not have an adequate foundation to rest upon. The nasal cavity then is not as large as it should be, but generally speaking, I believe that nasal stenosis precedes a constricted upper arch.

Dr. Jackson is right about the advantages to be gained by moving the roots of the teeth outward, and no doubt his appliance will do it. The roots of the teeth may also be moved outward in the use of the expansion arch by a modification of Dr. Angle's "working retainer," which is described in the March 1910 Cosmos. In this modification, which I believe is Dr. Dewey's, instead of running the spurs which are soldered to the arch into the tubes upon the teeth, the arch is placed near the gingival margin of the teeth with spurs, like fingers, coming down perpendicularly over the labial surface of each tooth, but not touching until they reach the incisal end of the incisors or the buccal cusp of the bicuspids. The arch stands away from the teeth at their necks. A wire is passed around the neck of the tooth and arch, drawing the root of the tooth outward. A band may be put upon a tooth with a little lug upon its lingual surface to keep the wire from pressing on the tissues, while the spur or finger presses the crown of the tooth inward.

I do not believe the rhinologist should perform a radical operation until after the orthodontist has expanded the dental arch. It is necessary for the rhinologist to remove adenoid tissue, but he should not, for instance, perform the submucous resection of bone, trim off the turbinate, or make as radical an operation as Dr. Jackson suggested they sometimes do, until the orthodontist has expanded the arch and secured as much breathing-space above as possible. Then, if necessary, the rhinologist can go ahead and do his worst—or best.

In closing, I would repeat that our patients may be treated painlessly and the nasal cavity can be improved. It is a matter not of the appliance so much, as of the individual skill in manipulating the appliance, just as one operator may take a set of excavators, or burs and pluggers, and put in a gold filling and hurt the patient considerably, while another will make the whole filling painlessly and equally as well with the same instruments.

Dr. B. Frank Gray, Los Angeles, Cal. While I might enter at once into a discussion of the expansion of the dental arches, with especial reference to the bodily movement of the teeth and to Dr. Jackson's method of doing this work, I have the belief that some understanding of the etiology of those cases of malocclusion requiring such treatment, as well as of the indications for the treatment itself, is of first importance.

Dr. Jackson has in one part of his paper practically stated that constriction of the dental arches causes nasal stenosis. Granting the truth of this, I still think his tendency is to approach the subject from the wrong direction. In a very great percentage of cases of this type the nasal stenosis is responsible for the constriction of the dental arches.

Hypertrophy of the lymphoid tissue in the dome of the pharynx, commonly termed "adenoids," is responsible for nasal stenosis in very many cases. This hypertrophied lymphoid tissue prevents the passage of the normal quantity of air through the nose. The extent of the abnormal growth measures the amount of air which may pass through. Hypertrophy of the turbinate bones, polypi, etc., are contributing factors to the same condition. The nasal occlusion, whatever its source may be, causes mouth-breathing, with the characteristic results which such a perversion of normal respiration

brings about. With the air-current passing through the mouth, the tongue no longer occupies its usual position in rather snug contact with the roof of the mouth and against the teeth. At the same time the constantly open mouth produces an abnormal pull of the muscles at the side of the mouth, and there is no longer the normal pressure of the lip against the upper incisors. The influence of the tongue from within and of the muscles from without, when properly balanced, are great factors in the maintenance of a normal arrangement of the dental arches. But with the lack of pressure of the tongue from within and the abnormal pull of the muscles at the side of the mouth, it may be understood why the dental arches may not develop to their normal width, while the protrusion of the upper incisors so often in evidence is explained from the lack of proper lip function.

At this stage the telescoping of cause and effect is often noticeable, as the irregular dental arches, especially of the prominent incisor type, make normal breathing impossible, even though the rhinologist has made a clear passage for the air through the nose. Hence the great necessity of establishing a normal arrangement of the teeth in such cases.

You certainly do not get a normally developed nose until you establish normal function of that organ, but the point I wish to make is that nasal stenosis, which arises from such causes as I have indicated, is much more likely to cause a lack of development of the dental arches than is the lack of development of the dental arches likely to cause nasal stenosis. To a lesser extent we find this series of cause and effect starting on the dental side, and in such cases expansion of the arches at the proper time should have a marked effect in stimulating normal development of the nose, which includes, of course, the bones forming its walls, providing that adenoids or other abnormal growths are not present.

A good point of diagnosis is that which has been dealt with rather thoroughly by Dr. Varney Barnes. He believes that at a period previous to the loss of the anterior deciduous teeth, there should appear what he terms "normal growth spaces" between these teeth. In the absence of such "normal growth spaces," he believes expansion of the dental arches to be necessary in order to provide room for the permanent teeth. I believe this is true, and it may be borne in mind that at this immediate time the roots of the deciduous molars are not absorbed to any considerable extent, and their outward movement would carry with them the crypts of the developing bicuspids. I do not think Dr. Jackson called attention to the fact that expansion of the deciduous molars at a time when the roots were well absorbed would fail to be productive of any benefit. At the age of from eight to eleven years the use of the X ray may be necessary in order to determine to what extent absorption has progressed.

It is reasonable to assume that in the absence of these so-called normal growth spaces, the nose is also lacking in its normal development. This is a second good reason for expanding the arches at this time, and is in line with Dr. Jackson's conclusion.

As to the immediate methods employed by Dr. Jackson in the bodily movement of the teeth outward, as I understand it, he expects to secure in a limited time the same effect that would ultimately be secured in case the teeth were tipped buccally. It has been shown many times that a normal development in the apical region follows treatment by the latter method. This is especially true in the cases of young children.

I agree that the two important considerations in this work are, first, to secure as nearly as possible an ideal result, and second, to secure this result with the least amount of discomfort to the patient. It is not worth while to waste our energy in strenuously defending appliances, for it is a well-known fact that one operator will do efficient work with an appliance of a certain type, while another man may fail to secure results with the same appliance but may make an eminent success with one of a different type.

It must be remembered in this question of the patient's comfort that the appliance used is only one part of the treatment. The skill of the operator, or his lack of it, not only determines to a wonderful extent the result of the operation, but stands in direct ratio to the amount of discomfort caused to the patients.

Dr. Jackson's method is ingenious, and I am sure that he can do effective work with it. Dr. Case accomplishes good results in the bodily movement of teeth, and while Dr. Angle very often prefers to use the ordinary expansion arch in this work, he does so with a knowledge that nature takes care of the normal development at the apices of the roots; but for more mature cases he has devised certain appliances for the outward movements of the roots themselves.

I am very glad to see Dr. Jackson's presentation of this topic. When it comes to the subject of nasal stenosis and deficient development of the dental arches, we soon get into a circle of cause and effect, and unless we are careful we do not know in which direction we are moving. There is room for much work along these lines, and certainly the dentist owes to his *clientèle* the benefit of a fair degree of understanding of this subject.

Dr. T. P. Hinman, Atlanta, Ga. It seems that there are two schools of orthodontia, as there are different schools of medicine. There are several viewpoints, *e.g.*, that of the orthodontist and that of the general practitioner of dentistry. The general dentist has to make a living and do a little tooth-regulating also.

I have been using the Jackson appliance for a good many years and have found it to be very satisfactory. It can be used successfully along with our general work, by making the movement once a week accurately by the chart. We are not all so situated that we can send our patients to a specialist, and it may be fortunate that we are not. The Jackson appliance, if made properly, has several advantages, and one of these is, that after regulating has been completed it is not necessary to spend four or five hours in building a retaining appliance. The best appliance for holding the teeth in their proper alignment is the one we have used in moving them.

Someone complained about too much distal expansion resulting from Jackson's appliance. This must have been due to the base wire being not large enough. The base wire was probably made out of No. 14; if it had been made out of No. 9 or No. 10, no lateral movement of the molars during expansion would have occurred.

As to pain being caused by wearing the appliance, I have been successful in moving the teeth without much pain, but I cannot say that I do not produce any pain whatever.

I know it to be absolutely true that in the lateral movement in the expansion of the arch by means of the Jackson appliance, if it is properly constructed, the teeth are not tilted as with an outside arch bar. In the illustrations shown on the screen by Dr. Ketcham you would notice that after his expansion of the arch there was considerable outward inclination in the molar and bicuspid region. After four years, at the age of nineteen, this was not rectified, and therefore, if we have an appliance that moves the teeth bodily through the arch, I believe that we obtain a more esthetic effect by this than by the other method.

We also have the advantage of being able to thoroughly cleanse the teeth during the process of regulating. Every time the patient comes to the office the appliance can be entirely removed and the mouth placed in a sanitary condition. This can be done with the arch bar, too, but it takes much more time to take out that appliance and readjust it.

Dr. R. D. Robinson, Los Angeles, Cal. Nobody deplores the necessity of making such remarks as I am going to make more than I do; but I believe the time has come—that it arrived a good many years ago—when it is not right for any man to appear before an association of this kind and claim originality for the conception of appliances to which exception might be taken.

Dr. Jackson said that he has conceived the idea of overcoming nasal stenosis by

the expansion of the upper arch. I want to refer Dr. Jackson to a paper published in the *Pacific Dental Gazette* in December 1905, which was read before the Lewis & Clark Dental Congress, in which exactly this same appliance was demonstrated. A great many men have discussed this appliance for a great many years, as for instance the late Dr. Crawford of Nashville.

This by way of criticism. Dr. Jackson is my friend, and I am sure he will not take exception to my statement.

Dr. Jackson is doing excellent work, and he accomplishes the results he claims by securing a more ample breathing-space by this operation.

As far as moving the teeth buccally and in a body is concerned, this can be accomplished by another method, *i.e.* by soldering longitudinally to the long side of the tooth a spur for the iridio-platinum arch. [Demonstrating.] The spur is slipped into place, and the extension will take place as much at the end of the root as it does at the crown, or more, or less, as desired. The operator has absolute control over the movement of the entire tooth, and I believe that method to be fully as efficient or even more so in my hands than Dr. Jackson's. Dr. Jackson's appliance may be more convenient in his hands, but in my operations I find this other one to be more efficient.

As far as cleanliness is concerned, I believe that the appliance I have just described is fully as cleanly as Dr. Jackson's, and perhaps more so, because he has a flat surface in contact with the tooth, affording a place for the lodgment of particles of food, whereas in the appliance I have described the band is soldered on, and nothing can come in between the band and the tooth, which renders it more cleanly and sanitary and does less damage to the tooth and the surrounding tissues than the other appliance, which requires cleaning every week.

Dr. Jackson (closing the discussion). I am glad that such a good discussion has been brought about on this subject, which deserves a great deal of attention. Regarding the statement made by the last gentleman, I think I ought first to speak of his assertions concerning the cleanliness of the appliance, its removal once a week, and so forth. The patient is always instructed to remove the appliance three times a day, which can be done with perfect ease. Any appliance that I construct or advise is and should be readily removed by the patient in a few moments. I stated that in my paper. If the appliance is not kept polished as brightly as it was when first put in the mouth, there is something wrong. It is your duty to see that the patient's mouth, teeth, and the appliance are kept thoroughly clean, and that the metal remains bright and polished.

Many dentists are making the mistake of advising against the employment of the ordinary base metals in regulating appliances, because they waste away. They do waste away if they are not properly cemented to the teeth. Base metal is being used for filling teeth. The same men who advocate the use of amalgam for saving teeth maintain that nothing but gold should be used for expansion bars and so forth.

Here is another consideration. We are trying to progress; we want to know something more on this subject. Amalgams are of about the same composition as the German silver materials, so we should not abandon the latter unless we abandon the amalgams. Antiseptics are very harmful to base metals, which deteriorate and turn black.

I want to warn the operators who use fixed apparatus in the mouth against too strong washes or solutions, which will disintegrate base metals.

That is the purpose of an easily removed appliance—that it can always be taken out and cleansed, and that no antiseptic is needed while the apparatus is in the mouth. We expect the appliance to be just as bright at the end of one year as it was when it was put in. That is why chemically pure tin was chosen as a solder.

The use of spurs on the bar is not new. It was devised by Dr. Angle. I wonder why no one has called attention to another apparatus which has two bars, one con-

nected with the other, which was brought out thirty to forty years ago, and used very extensively for regulating and moving teeth bodily. I am certainly far from claiming that I am the inventor of the only system of moving teeth bodily. I have not claimed anything that is not my own, and I am giving it to you that you may carry it to greater perfection.

Regarding nasal stenosis, I do not think that I can be misunderstood if you read my paper carefully. We expand the arches only when we find such a condition as renders it necessary. As to the time of beginning, it was stated years ago that regulation of the teeth should be begun while they erupt, or as soon thereafter as practicable. This remark has been quoted many times, but no orthodontist has given its originator credit.

The distal part of the arch in about eighty-five per cent. of cases is broad enough in my experience.

Expansion of the arch should be instituted as early as possible, but only if necessary. I spoke of the spaces between the teeth. When these spaces are not present, it is our duty to expand the arches immediately. When the deciduous bicuspids are being resorbed, even though the roots are but partially resorbed, I do not hesitate to move them bodily, because that aids in the expansion.

The advocates of the Angle system claim that if the canines are moved out, the whole arch need not be expanded. I prefer, however, to expand the whole arch.

Nasal stenosis preceding constriction is due to some constitutional or climatic condition. It is our duty, then, to thoroughly correct this trouble. We should so educate the people that they will bring their children to us for the purpose of examination, so that we can discover these conditions at an early date.

It is not my purpose to disparage anyone, but I merely wish to state that we are all working for one great cause, and are trying to improve abnormal conditions. I have pointed out a system that is very convenient for the patient, the children never complaining. With this system, as I stated, combined with the use of the chart and the tracing, the arch can be expanded to any desired extent.

The Chairman then declared Section I adjourned until the next annual meeting of the association, viz, on the fourth Tuesday in July 1911, at Cleveland, Ohio.

SECTION II: Operative Dentistry, Nomenclature, Literature, Dental Education, and Allied Subjects.

Chairman—L. L. Barber, Toledo, Ohio.
Secretary—F. L. Platt, San Francisco, Cal.

Tuesday—*First Session.*

The first session of Section II of the National Dental Association was held at 2 P.M., Tuesday, July 19, 1910; Dr. L. L. Barber, Toledo, Ohio, chairman.

The Chairman. The first paper of this afternoon will be read by one who is very well known to all of you, Dr. J. V. Conzett of Dubuque, Iowa, and is entitled "The Gold Inlay."

[This paper is printed in full at page 1339 of the present issue of the Cosmos.]

Discussion.

Dr. Don M. Gallie, Chicago, Ill. I know that everyone present regrets that Dr. Taggart of Chicago is not here to open this discussion, and no one regrets it more than I, because it would have been to our great satisfaction to have had this paper discussed by the man who has made the splendid and efficient restorations of today possible.

First of all, I wish to compliment the essayist upon this most admirable paper.

Strange as it may seem, though the inlay represents a somewhat new idea in dentistry, the fad for it is lasting a little longer than some other fads that have been exploited and taken up by the profession quite generally, only to die out after a while. Those of you who are in the habit of attending the National or any dental meetings have noticed that in the past few years different waves have taken us off of our feet, and as each year rolled around, some new wave has come up and the old one has receded.

I am glad that Dr. Conzett writes about the gold inlay from the standpoint of a gold-filling enthusiast.

Like Dr. Conzett, I am a great believer in the gold filling. We have done most wonderful work with that material, and will continue to do so, but I realize that there is a place for the gold inlay; that it has come to stay, and that the operator who is not giving it his attention and using it in his practice is not rendering the best service to his patients which they are entitled to receive.

In the beginning of his paper the essayist spoke of the cavities in which inlays are indicated or contra-indicated. He spoke of those anterior fillings where an excessive cutting and sacrifice of tooth structure would be necessary to make a cavity from which a model could be withdrawn. I do not believe that any member of the National Association or of any progressive dental society would think seriously of putting a gold inlay in such a cavity, because we have another filling material for such cavities which is fitted in every way to make a restoration that is substantial and esthetic, namely, porcelain. To make a good porcelain restoration it is necessary for the operator to cut as much, and in some cases to extend the preparation even farther than for the gold inlay, but none of us would seriously consider inserting gold inlays in the anterior teeth, except perhaps in some cavities in canines, when the caries extends to the lingual surface, or very far under the gum margin, so that the adjustment of the rubber dam and the insertion of foil would be difficult. In a few exceptional cases, then, I find that a restoration by the gold inlay process is very acceptable and advisable.

I was pleased that the essayist made special mention of those complex cavities in bicuspids and molars that extend gingivo-lingually and gingivo-buccally to such an extent that they are much wider between these angles than at the approximo-occlusal angle. In such cavities I much prefer to use foil, for, as you could see by the cavity portrayed in the last illustration, it would be impossible to withdraw a wax model occlusally from such a cavity. It is claimed by some operators that the wax model can be removed by a lateral displacement, but to do so we must have exceptionally wide separation, which is not always obtainable, and I therefore prefer to use foil in this class of cavities, believing that I can make a better restoration at a smaller sacrifice of tooth structure.

The merit of the gold inlay over other methods is that it has brought us to a realization that the theory of extension for prevention has gone beyond the theoretical stage, and is a necessary procedure for meeting the conditions presented.

The essayist speaks of the need of extending the margins buccally, lingually, and gingivally, also of the embrasure. From my observation and clinical experience I am afraid that many practitioners, who are in a measure thorough, painstaking, careful, and skilful operators, do not have a correct conception of the embrasure. The embrasure is the point at which the tooth curves from the approximal to the buccal and lingual surfaces. Conditions differ in different teeth. The embrasures found in a denture with long and bell-shaped crowns require different treatment from those of the short thick type, with broad top and a greater unclean surface area. Here greater extension of the margins is required than in teeth with bell-shaped crowns and small necks.

I was disappointed that the essayist did not lay more stress upon the occlusal portion of this cavity. Caries occurs upon the approximal surfaces of the teeth, because these are unclean areas, and we need to carry the margin to an

area of practical immunity, bringing the margin of the cavity to a surface where it can be kept clean. The tooth structure upon such a surface is naturally perfect. The problem is a different one in occlusal cavities. Here the cavity does not lie in an area of uncleanliness, but in one of structural defects, and we must realize the necessity of carrying these cavities to the end of the occlusal defects, just as we carry them to the extreme point buccally, lingually, and gingivally. A great many operators, while paying close attention to the approximal portion of cavities, neglect in a great measure the occlusal portion. In my opinion we should lay great stress upon this part of the operation.

The essayist spoke also of the different forms of cavity preparation, the outline, the resistance, the retentive, and the convenience forms, and we must realize the importance of the different steps in cavity preparation. The most important of all these is the resistance form. We must so slope our cavity that it resists stress from all directions, and this can only be accomplished by the broad seat of which the essayist spoke, the parallel walls, and the proper shaping of the step at a right angle to the axial wall. That, in my opinion, is one of the most important features in cavity preparation, and too many of us are content to make the occlusal step shallow and narrow, so that it will not resist stress sufficiently, the result being that in time a displacement or loosening of the filling occurs.

The essayist also laid some stress on the mistake made in placing too much dependence upon cement. I am afraid that few operators realize that the cement is the weakest part of the operation. Two or three years ago I read a paper before our state society on the "Gold Filling *vs.* the Gold Inlay," and in order to obtain some idea of how various operators manipulate cements in connection with the inlay, I sent around to about one hundred dentists in the city of Chicago for samples of mixed cement, requesting them to mix that sample in the manner in which they would mix it for setting inlays in their everyday practice, and not to take any particular pains except such as every careful operator would take in mixing; also to indicate the time in which the sample was mixed, and particulars. I made at least fifty experiments myself in the same way; and it was a matter of great wonder to me how many different results were obtained by various operators using various cements. Some samples furnished by the best and most enthusiastic inlay workers, together with the data requested, showed that the time required for crystallizing varied all the way from two to twenty-four hours, and some of the samples were still imperfectly crystallized at the end of six days, and not to be depended upon for maintaining a filling in place. I therefore came to the conclusion that the weakest point in the inlay is the cementation. In my opinion we cannot place full confidence in this operation until in some way we can overcome the weakness of the cement, and have someone produce a cement that can be relied upon.

Dr. Conzett's theory about the expansion of the dentin under the pressure necessary to force an inlay to place or to insert a filling is not entirely new to me, yet I doubt if there is sufficient elasticity in the dentin to materially affect the retention of the inlay.

Of all the many good points mentioned in this paper, none impressed me so satisfactorily as the beveling of the margin. When the cast gold inlay was first presented to us, all its advocates from the Atlantic to the Pacific had the idea that it was a great success, and that there would be no failures; and they believed that all that was required was to make the margins sharp, and to carve the wax flush with the tooth surface. It did not take very long to find out after the casting of such models that there was some contraction, and that the finishing and polishing of such inlays reduced the gold surface below the tooth surface, and consequently a resting-place for the propagation of bacteria was formed, and caries recurred.

If a margin should be beveled in a gold filling, it certainly should be beveled in an inlay, in order to furnish protection

for the enamel rods, and more especially for the cement. The beveled portion of the inlay must be well burnished over the margin, and the cement thus prevented from gradually dissolving.

The essayist touched upon the preparation of the model and the manipulation of the wax. I think we should use the best that the market can supply. Many of our failures in inlay work are due to the fact that not sufficient care is taken in putting the wax in the cavity, and even with proper care at times a shifting of the wax occurs. If in a complex cavity the wax is inserted, forcing it up against the adjoining tooth, the patient can close the jaws, producing occlusion and forcing the wax into the cavity. The wax model cannot be trimmed properly unless it is removed, so that the approximal contour can be finished. In doing that the fine margins are jeopardized. Then the model is placed back in the cavity, and in doing so the wax is liable to be forced in the direction of the least resistance, *i.e.* away from the axial wall. If the operator then takes the burnisher and apparently smoothes over the margins, he may be deceiving himself into the belief that the wax is in absolute contact with and perfectly adapted to all portions of the cavity, while in reality it is merely touching upon the margin, instead of touching the axial wall. In this procedure I have found a great aid in the matrix. If a matrix is applied, we know something about the occlusion. In the average inlay in approximo-occlusal cavities of molars carving does not amount to very much. Usually an inlay looks about the same as a gold filling. We show there the marginal ridge and a smooth surface upon the occlusion. The matrix does not interfere with the carving. I therefore adjust a matrix on the tooth, then place the wax in it as soft as I can manipulate it without it becoming greasy, and force it into the cavity. There is no forcing-out of the wax in the direction of the least resistance, the wax going not only into the cavity, but slightly beyond the margin. If one wants to be sure as to the occlusion, the matrix can be removed, and the patient may lightly close the jaws, as is done in inserting an amalgam filling. When finished I remove the wax model, which has a perfect contour, absolute contact, the proper mesio-occlusal diameter, and a fine, smooth surface. It can then be invested, or, if preferred, the inside of the model can be painted, and the investment will show through the thin film of wax that is crowded in between the matrix and the tooth surface. With a sharp knife I shave that off, leaving a sufficient bevel, which is wanted for procuring a beveled margin. In this way I find the matrix to be a great aid in the most difficult approximo-occlusal cavity. I can procure a wax model for such a cavity in less than two minutes, which is something to be considered from the standpoint of time-saving to the operator and patient. The model procured I know to be in contact with every portion of the surface of the cavity. Since adopting this method I have had very few inlays to make over. I have some failures yet, it is true, possibly when I have neglected some detail.

We hear so many advocates of the inlay say that it is so much easier for the operator and the patient. The easy road to anything is always a dangerous one. The inlay enthusiasts tell us that we can prepare the cavity and complete the operation from start to finish without adjusting the rubber dam. For my part, I prefer to have the rubber dam adjusted in approximal cavities extending to the gingivo-buccal and lingual surfaces, as shown by Dr. Conzett. If prepared under moisture the cavity cannot be protected. The dentin is infected, and if the cavity is not kept perfectly dry we are sometimes unable to accurately distinguish infected tooth structure. In most cases, therefore, I prefer to have the rubber dam adjusted so that I can remove every trace of infected or affected dentin.

I have made inquiry of a great many of the cement manufacturers regarding the efficiency of the so-called hydraulic cement. They say that it is all right, if properly manipulated, but you cannot

slap cement into a cavity and then force an inlay into it with the floodgates open for the entrance of saliva. Saliva does not aid the crystallization, but retards it. But if the tooth is kept dry for a certain length of time, the admission of saliva to the cement will assist crystallization. The preparation of inlays in a haphazard manner will invariably result in failure.

Dr. Conzett said nothing about the procedure to be followed and the care to be taken in casting inlays. We know it is necessary to have a proper cavity preparation in order to secure a good inlay, and a proper model to fit the cavity, but it is also necessary to follow the same careful method with a cast model as with the wax. Yet how many operators simply experiment? Frequently the gold inlay does not come out with the exact dimensions of the model; it contracts or changes form in some way. Dr. Marcus Ward, less than a year ago, carried on exhaustive experiments along this line, demonstrating that the selection of the gold for casting is one of the most important features of this work. He showed that gold which is used over and over again, as has been the practice of many operators, loses its fluidity and cannot be melted at the same degree of heat as fresh gold. He also pointed out the great danger of using scrap gold for this kind of restoration, conclusively demonstrating that inlays made of scrap gold or low-karat gold cannot be depended upon on account of the change in the form of the gold, which causes imperfect margins and distortion.

This whole question resolves itself into a mere proposition of good common sense. In the insertion of a gold foil or an amalgam filling or in the preparation of a crown, we simply come down to a proper realization of the limitations of all dental operations. The inlay in one mouth may be indicated, yet in another, even in the same kind of cavity, it may be entirely contra-indicated. The same may be said of gold foil, of porcelain, or any of the different filling materials. If we intelligently realize all these limitations, then it is merely a question of exercising judgment in adopting the proper method in the restoration of lost tooth structure whenever required.

Dr. J. F. Wallace, Canton, Mo. It has been a source of great pleasure to me to listen to this able paper of Dr. Conzett, and I am convinced that all of you have been interested and instructed as well. Dr. Conzett has given me a great deal of inspiration by his gold foil work. The great satisfaction that I have derived from the fillings which he has made for me has created in me a desire to be able to use that material in all cases indicated, and in my opinion, gold foil is the filling material *par excellence*.

I am not willing yet to discard my pluggers, as others have done, and to resort to the gold inlay exclusively, but prefer the gold filling in a large number of cases, because better service can be rendered to patients by the insertion of a good gold filling than is possible with the use of an inlay.

Dr. Conzett remarks that it is not possible for all men to become expert gold operators, yet I believe that a great many more dentists could become good operators if they would only take the time, exercise patience, and be systematic in all the details of the operation.

I fear that the dental profession as a class cannot be characterized as systematic in their methods. If our great business enterprises throughout this country were conducted with the same lack of system which is characteristic of most dentists in making a gold filling, there would be many more failures in undertakings which today are marked with success. How many operators pay that close attention to cavity preparation in every detail, step by step, that Dr. Black has taught? If these details are neglected, failure will follow, or the operation will at least fall far short of the highest standard.

It is most important for us dentists to learn how to study the conditions present in the teeth and mouth which we are treating. There are no two cases in which the conditions are the same, and the careful and successful operator

must in every case determine what is necessary—a gold filling, or a gold inlay, or an amalgam or porcelain inlay—before proceeding with the operation. The condition present in the individual mouth should be the exclusive guide in all our operations.

No operation is stronger than its weakest point, both in regard to cavity preparation, if the cement margins around the inlay are left exposed, and in regard to extension, and the accuracy with which the preparation is made for the securing of the filling. If that weakest point is recognized, the greatest effort should be made to render that vulnerable point as secure and as perfect as possible, for otherwise it will be a source of failure, and all efforts to preserve the tooth will be of no avail.

It has been rather interesting to me to notice, as the years have gone by, that so many operators who in the past ridiculed the idea of extension of the cavity margins and carrying them into areas of immunity, are now so generally advocating the employment of the gold inlay and the sacrificing of a greater amount of tooth structure than they were willing to concede in order to secure a good gold filling. They are now even sacrificing tooth structure beyond the areas necessary for the prevention of recurrence of caries, for they sacrifice dentin in the occlusal portion of teeth for the purpose of withdrawing the model, as shown by Dr. Conzett, although this area is not susceptible to caries. I believe, however, that on the whole a better cavity preparation is employed for the insertion of gold inlays than has been used in the past for gold fillings, and if the introduction of the inlay does no more than bring about a realization of the necessity for the extension of cavities at the margins in order to bring them into areas of immunity, its value will be a no mean one.

The conditions of susceptibility to recurrence of caries are the same in inlays as in gold foil fillings. If the embrasure or interproximal space is to be protected in a gold foil filling, the same holds good for a gold inlay, and that particular point should not be neglected under any circumstances.

Dr. Conzett speaks of the necessity of making a proper point of contact, for the omission of which there is no excuse. It is quite as easy to secure that contact point in a gold filling as it is in an inlay. Much of the patient's comfort and the preservation of the health of the surrounding tissues depends upon a proper contact point, and it is a source of great regret to have a patient come back complaining of the wedging of food in the interproximal space and the resultant wasting away and destruction of the gum tissue.

Dr. Gallie has laid some stress upon the use of the rubber dam, and I think his remarks were very timely. No one is more justified in preparing a cavity for an inlay without the protection of the rubber dam than he is for the insertion of a gold foil filling. No operator can absolutely tell whether a cavity has been properly prepared, if it is moist. If he is able to do so, he possesses an excellency of eyesight not given to most of us. The practice of many operators of setting inlays without adjusting the rubber dam is to be condemned. The fact that we have cements which are said to be capable of setting in the presence of moisture is no reason why they should be floated in a medium of bacterial cultures, which of itself should be sufficient to impress the necessity of securing absolute freedom from moisture, even though the so-called hydraulic cement might crystallize properly. Since bacteria are present in the saliva, it is only a question of time when caries will recur on account of bacteria having been sealed into the cavity with the cement.

It is a matter of regret that the profession should be going after every innovation like a herd of sheep following the bell-wether. As soon as an operator brings out some new operation, we all run after him, instead of waiting to have the innovation tried out. The dental profession is too prone to look for something easy, rather than to test and learn to use new materials and to perform such operations as have already stood the test.

If we were as enthusiastic in learning to use the old and tried materials and to select the best ones for our operations as we are in getting acquainted with the new things that are presented to us, we would no doubt serve the public a great deal better.

I do not wish to convey the idea that I am altogether opposed to the inlay, because I believe that there is indeed a large field for its use. It is decidedly indicated in very many places. Nervous patients, whom it is almost impossible to control a sufficiently long time to make a first-class gold foil operation, can be better served by using the gold inlay. That class of cavities mentioned by the essayist, which would require a sacrifice of the occlusal surfaces and restoration by a crown, might very often be cared for by the use of the inlay, also inaccessible cavities, in which it is not possible for us to reach every portion of the cavity for proper condensation of a gold foil filling. In such cases I would prefer the inlay. In young patients whose teeth are not sufficiently developed, and in whom, because of the undeveloped condition of the roots, there is danger of injuring the pericemental membrane by malleting and properly condensing a gold foil filling, rather than to take the chance of doing permanent injury I would use the inlay. Patients who, because of constitutional weakness, are unable to undergo the long and tedious operation of a gold filling, and those in whom a plastic filling material would not be satisfactory, should also receive a gold inlay.

After all, as Dr. Gallie has said, it is a question of studying conditions and realizing when it is best to use this or some other material. I would therefore advocate a method of intelligent selection rather than make the inlay a paramount consideration, universally using it whether indicated or not.

Dr. R. Ottolengui, New York. In the discussion of this question of the inlay, I want to set up an entirely different system of deciding whether to use gold inlays or gold foil fillings. It seems to me that deciding in favor of the gold foil filling if the cavity is accessible, and choosing the gold inlay if the cavity is inaccessible, implies an injustice to cases in which the cavity is inaccessible. The operator cannot make such a discrimination unless he feels certain that his gold fillings are better than his gold inlays.

In my opinion the salvation of the tooth by any filling material should bear no relation to the accessibility of the cavity, or to the ease or difficulty with which one or the other operation can be made. If the gold inlay is admittedly good enough to save one tooth in a mouth, it is good enough to save any tooth, aside from cosmetic considerations which may prompt one to prefer porcelain to a display of gold.

I would therefore make a discrimination of this character: I would use the gold inlay in any cavity in which the insertion of a gold filling would necessitate more than half an hour of time. You may ask, "Why that discrimination?" For the reason that I believe teeth can be successfully saved by either method, and that if a filling can be placed in one-half hour in one sitting, it is an injustice to the patient to compel him to come back for the insertion of a gold inlay. But if it would require more than half an hour to put in a properly condensed gold filling, the convenience as well as the needs of the patient are better complied with by the insertion of a gold inlay.

I wish also to say a word regarding the correction of the contact point. It is quite true that a perfect contact point can be made with a gold foil filling; but it can be made better, much more certain, and with much less distress to the patient, with the gold inlay. For you cannot expect to make a perfect contact point in a gold foil filling without first separating the teeth, and the polishing away of the rough parts and the trimming of the filling to the contour which we desire to maintain is always a question of guesswork. By long experience *we learn to guess accurately,* yet sometimes we make a mistake, and then the contact point is not restored when the contiguous teeth return to position. We

may have the misfortune, in polishing a gold filling, to find a deficiency that must either be left or be burnished out, and if it is left, the filling is defective. That is not true with the gold inlay. It is easy to make a perfect contact point, because you can over-contour the wax pattern, allowing for the removal of an amount of gold in the polishing process, and if you should make the mistake of cutting too much when polishing the inlay, the contact point may be restored by solder. It is a question in my mind whether it is not really better to make the contact point with solder, because this is a harder metal and will receive a higher polish; the making of a contact point of gold against a contact point of enamel requires that the metal should be highly polished.

Just one word in reply to Dr. Gallie. He pointed out a difficulty in the use of gold inlays in occlusal cavities where the gingival margin is wider than the occlusal opening. Dr. Gallie started out by saying that he regretted that Dr. Taggart was not here to open the discussion, but Dr. Gallie was present when Dr. Taggart answered this identical question. At the January meeting of the Odontographic Society, this kind of cavity was declared to be a place where the inlay is not serviceable. Dr. Taggart was called upon to reply, and his answer was this: That while it is rarely necessary that such a cavity be left with a narrow occlusal opening, still if one desires to so leave it, the approximal surface can be inlaid first, and a groove can be cut through the approximal inlay and a second interlocking inlay be placed in the cavity. That is a great deal better for the patient than to select one of the most difficult cavities and compel a patient to sit for hours, when in this progressive age it is absolutely unnecessary to have a patient remain in the chair longer than thirty minutes for filling a tooth.

Dr. Gallie. I remember the discussion in Chicago mentioned by Dr. Ottolengui. Dr. Taggart spoke of this kind of cavity and the restoration by a double inlay, one inlay for the gingival two-thirds and the other for the occlusal third. I am sure that but a small portion of the audience believed that such a procedure was practicable, and I challenge Dr. Ottolengui or anyone else to treat these cases successfully by such means. There may be an isolated case where it can be done. The distance from the axial wall to the adjoining tooth is so great that it would be most difficult to secure sufficient separation to remove the wax model.

Dr. M. L. Rhein, New York. It has been an exceedingly great pleasure for me to listen to the paper of Dr. Conzett and to the discussions which have followed. I have been rather disappointed by the discussion of Dr. Ottolengui on this subject. I believe that the first three speakers have best represented the general consensus of opinion on this question. We are not in a position to indorse the statement that thirty minutes should be the limit of an operation for the permanent restoration of any tooth.

The question regarding the cavity which Dr. Ottolengui spoke of has never been answered by Dr. Taggart. I must say that I agree with the position taken by Dr. Gallie. It is inconceivable to me how the wax can be withdrawn from cavities which extend to some depth, at least at the pulpal portion and down toward the root of the tooth.

The method that I have found valuable in such cases, when an inlay is to be made the main portion of the work, is to introduce a filling first. If the cavity extends to some distance under the gum, this filling can be made of amalgam. If the rubber dam can be properly placed, I usually insert a gold filling in the lower gingival third if I wish to preserve the upper portion, and restore the occlusal portion of the approximal surface by the insertion of a gold inlay. This seems to me not only more practical and easy, but we are sure of a much more perfect result as far as the gingival portion is concerned.

One portion of Dr. Conzett's paper interested me greatly, namely, that regarding the beveling of the margins, and I would like to dwell a little on that par-

ticular point. I believe that this beveling of the entire margin of the cavity, starting at the gingival portion and proceeding up the axial walls, taking in every portion of the occlusal surface, is one of the most important points in cavity preparation, and if I were to attempt to criticize Dr. Conzett's paper, I would simply say that I believe in a more liberal beveling than appears in his illustrations. Frequently in approximal cavities which necessitate a very extensive cutting away of the side walls, the extension necessary for insuring a permanent operation can be readily obtained by an extensive bevel along the axial wall, without any unnecessary cutting into the dentin itself.

I wanted to emphasize this one most admirable point of the paper, viz, that a butted margin is not a method by which a permanent result can be secured.

For the question of selection of either a gold filling or a gold inlay, no rule can be laid down. I believe the speaker who said that this must be left to the mental status of the individual operator has described the situation properly. It depends on the method of different operators. We can establish a general rule for ourselves, but not for other men.

My own method is to invariably fill a cavity of easy access, and in two approximal cavities, I invariably put a filling in the one that is easiest of access, and an inlay in the adjoining one, because it is very simple to make a perfect filling in the former, but not always in the latter.

I believe the tenor of the discussion that we have listened to leads us to believe that while we recognize the great value of the inlay and all that has been claimed for it, yet for a perfect preservation of tooth structure the gold filling still maintains its pre-eminence; that is to say, when it can be inserted under perfect conditions as described by the essayist.

Dr. Ottolengui. I just want to say in reply to Dr. Gallie that there is no such cavity as he described. If he will prepare the cavity properly and produce the amount of space necessary for inserting a proper gold foil filling, I will accept his challenge and make either a single or double gold inlay for it.

In response to Dr. Rhein, who said that he is not ready to accept the statement that thirty minutes should be the time limit of an operation, I would say that he has misconstrued my remarks. I said that it is unnecessary to keep a patient in the chair longer than half an hour. If you want to take hours for the operation, I am perfectly satisfied you should do so; if the patient is given only one half-hour's sitting, three hours are spent in the laboratory, and another half-hour at the next sitting, the patient will be willing to pay twice the amount of money with twice the pleasure.

Dr. Conzett (closing the discussion). The very best part of the instruction regarding the subject of a paper is in my opinion generally obtained by the discussion; surely that has been so in this case. I want to thank the gentlemen who have discussed the paper for their kind appreciation of my effort.

I did not attempt to go over the whole field of the inlay, as this would be impossible in the time allotted to this subject. I simply touched upon those points which seemed to be important and which seemed to require emphasis, for the benefit of those who may be troubled with any doubts about this subject. I purposely did not touch upon the subject of casting, because that question has been answered by operators better qualified than I, and because Dr. Ward of Detroit and Dr. Baker of Davenport are still working in that field.

Cavity preparation should be given more careful consideration than the majority of the profession are devoting to it. I believe that we appreciate some of the faults of the past, and should therefore resolve to make more thorough cavity preparation for the insertion of inlays in the future.

I could not and would not try to lay down any rule according to which a gold filling must be made in one place and a gold inlay in another—that being a matter of the personal equation. One of my very best professional friends is

a most enthusiastic inlay worker, and makes nothing but inlays. He confessed to me that he did not make gold fillings because he was never satisfied with any of his gold fillings. He found out that for him it was a physical impossibility to make a perfect gold filling. Therefore, if an operator cannot make a perfect gold filling, it would be very undesirable if he attempted it, and if he can make a perfect gold inlay instead, it is the best for him to do so. There are very few operators who cannot make good gold fillings if they would attempt to study the fundamental principles underlying them, as they are taught by Dr. Black. I believe that a well-made gold filling is the best thing we can possibly place in a tooth.

I am not going to join in the controversy that has arisen over this paper, but I merely wish to say that I would never make an inlay for a cavity if I were not able to make a satisfactory one.

(To be continued.)

PENNSYLVANIA STATE DENTAL SOCIETY.

Forty-second Annual Meeting.

TUESDAY—*Morning Session.*

THE forty-second annual meeting of the Pennsylvania State Dental Society was called to order in the assembly room of the Board of Trade, Harrisburg, Pa., Tuesday morning, June 28, 1910, at 10.30 o'clock, by the president, Dr. W. D. DeLong, Reading, Pa.

The meeting was opened with prayer by Rev. Ellis M. Kremer, Harrisburg.

On behalf of the city of Harrisburg, the mayor, Hon. E. E. Beidleman, welcomed the society to the city.

REPORT OF THE COMMITTEE ON DENTAL SCIENCE AND LITERATURE.

Dr. A. P. LEE, as the Committee on Dental Science and Literature, made the following report:

The duties of your Committee on Dental Science and Literature are defined in the by-laws, article XII, section 4, as follows: "To report annually, on the first day of the annual meeting, on the progress of science and literature as appertaining to dentistry, and give a *résumé* of all that may be new and important."

Having had to blaze our way, so to speak, this committee having been created under the reorganization plan, its new by-laws having been adopted at last year's meeting, we ask that a reasonable degree of leniency be extended toward this report, knowing that succeeding committees will take advantage of our errors of judgment.

The committee's duties appear so broad, and we are presented with such a wealth of material from which to choose, that nothing save the elimination of everything not strictly new or of unquestioned value can be included in a report that would otherwise be of such length as to prove wearisome.

It is quite a common thing to hear the thought expressed that dentistry is "written out," or that "dentists are not writers." We would respectfully suggest that if any member of this society holds that attitude toward his professional brothers, he be given a place hereafter on this committee. The process of eliminating good material cannot fail to bring about a professional change of heart.

Those subjects most engrossing the dental mind during the past year, together with some of the best papers thereon, will be spoken of briefly, as follows:

Dentistry in preventive hygiene, under which may be included the various contributions to the study of dietetics and mastication, as also the writings on oral prophylaxis, has received marked attention.

Restorative dentistry, particularly that

portion involving cast metal fillings and appliances, has probably received more universal attention than any other one branch, and our mechanical geniuses are vying with each other in their efforts to produce more simple and effective methods toward overcoming the shrinkage of cooling metals.

Salivary analysis as a means of diagnosis has never received more attention than at the present time, and the general practitioner has found this a valuable aid in determining obscure diseases.

The question of the *care of the teeth and mouths of the poor,* more particularly the children, has never occupied such prominence in both the minds of the public and the profession as it has during the past year. There is scarcely a city of any importance that has not taken up, in a civic way, this most urgent matter.

Dental education and legal qualification have always been favorite themes, but it is safe to say that at no time—possibly excepting that chaotic period of the early '40's—have these subjects been given the attention by the thinking men in dentistry, both in this country and abroad, as during the past year. Some surprising results have come from this agitation: In the state of Virginia, coincident with the graduation of those men beginning their dental college courses in the session of 1910-11, no one may become a fully qualified dentist without having received the additional studies and degree of Doctor of Medicine. The opposite extreme would seem to be that condition of affairs existing with our English cousins, who at present need neither college degree nor legal registration.

Many valuable papers on the subjects mentioned have appeared in print during the past year. On the subject of dentistry as a preventive measure Mr. Horace Fletcher of New York delivered a lecture before the Seventh and Eighth district societies of that state on "The Importance of Dentistry in Preventive Hygiene," which is printed in full in the Dental Cosmos for 1909, page 187. This paper sets forth Mr. Fletcher's well-known views regarding dietetics, and is a noteworthy contribution to our periodical literature. Excellent papers on oral hygiene have appeared from the pens of Drs. Paul Gardiner White, F. A. Johnston, and L. C. Taylor, all read before the National Dental Association at its last year's meeting, and printed in full in the proceedings of that body. Most of these papers take up also the subject of free dental dispensaries for the poor, while other essays deal exclusively with the conditions existing in the mouths of school children. For the sake of those interested in this line of work your committee would call attention to the exhaustive report, by Dr. Russell W. Bunting, of "The Examination of the Mouths of 1500 School Children in the Public Schools of Ann Arbor, Mich." (March 1909 Cosmos, page 310), also to the report of our own Committee on Oral Hygiene and Public School Dental Education, presented at last year's meeting and printed in full in the proceedings.

So many good papers bearing on that portion of our work popularly known as *operative dentistry* have appeared during the past year that your committee can call attention to but a few. That excellent essay by Dr. G. V. Black, presented at last year's annual meeting of this society, has, of course, been read by all; while the same author presented, at last November's meeting of the Academy of Stomatology, Philadelphia, an equally valuable contribution, entitled "A Plea for Greater Earnestness in the Study of Caries of the Enamel in Its Relation to the Practice of Dentistry." The *Dental Brief* for March prints Dr. Black's paper in full. Two papers presented during the past year, which might well be read conjointly or in parallel, as illustrating widely divergent views regarding what is usually accepted as a well-established principle, are: "Cavity Preparation with a View to Elimination of Recurrent Decay," by Dr. O. L. Hertig of Pittsburg, read before the Academy of Stomatology, Philadelphia, last November, and that by Dr. P. B. McCullough of Philadelphia, entitled "Wherein Clinical Evidence is At Variance with Extension for Prevention," read before the Susquehanna Valley Dental Society, May 18th. Dr. Hertig's paper appears in the *Dental Brief* for April 1909, while that of Dr. McCullough is printed in the Dental Cosmos for October.

A valuable addition to the periodical literature bearing on *dental pathology* is that by Dr. Otto E. Inglis, "The Central Thought in the Consideration of Pulp and Pericemental Diseases, with Especial View to Diagnosis." This paper appears in the Dental Cosmos for September. Dr. A. Hopewell-Smith of England, presents in the same journal, for December, "The Pathology of the Pulp in Relation to Clinical Dental Surgery," while the *Dental Brief* for the present month contains a paper very definite in its relation to dental pathology, by Dr. Horatio C. Wood, entitled "The Use of Disinfectants in Dentistry."

"Dentistry, as a Branch of Medicine, Should be Practiced Under the M.D. Degree" is the title of a paper by Dr. Frank W. Stiff of Richmond, Va., the only state now

requiring that degree for the dental practitioner. This paper and a portion of the discussion following, which may be found in the *Journal of the Allied Societies* for March 1910, very fully present one side of this subject. The opposite phase is well expressed in a paper printed in the DENTAL COSMOS for May 1909, with the caption, "Would the Medical Degree Add to the Professional and Social Standing of the Dentist?" The latter paper, viewing the subject negatively, is, strange to say, from the pen of a man holding both degrees, Dr. Edwin T. Darby, while Dr. Stiff, who holds the D.D.S. degree only, takes the affirmative side. Your committee would also call attention to a paper by Dr. Edward C. Kirk, read before the Susquehanna Dental Association at its May 1909 meeting, entitled "The Question of Medical Education for the Dentist," while the same author, in an address delivered at the dedication of the new building of the Royal College of Dental Surgeons, Toronto, entitled "The Cultural Factor in the Dental Curriculum," presents the broader aspects of dental education. The latter paper is printed in *Science* for April 1, 1910.

Your committee would call attention to excellent papers on the subject of casting metals by Dr. Weston A. Price, Dr. James G. Lane, and Dr. M. L. Ward. *Items of Interest* for July contains an excellent article by Dr. F. B. Noyes on "The Structure of Enamel as Related to Cavity Walls," while the *Journal of the Allied Societies*, in its September number, prints a notable paper from the pen of Dr. Theodore C. Beebe, Jr., with the title, "The Opsonic Treatment of Pyorrhea Alveolaris."

New Books.

In 1868, before the American Dental Association, Dr. M. S. Dean, chairman of the Committee on Dental Literature, prefaced his report as follows:

"Since the last report to this association there have been no new books, unless it be that of Arthur on 'The Decay of the Teeth,' added to our dental literature."

When we view the dental books of a twelvemonth at the present time, but little over forty years since Dr. Dean reported on the one work, we cannot but feel that we have a tangible and substantial proof of the wonderful progress of our profession.

We have time to mention only a few of the most important books on dental subjects which have appeared since the beginning of 1909, and shall have to omit later editions of works already in print, as also works written in other than the English language, many of which deserve mention:

"A History of Dentistry from the Most Ancient Times Until the End of the Eighteenth Century." By Dr. Vincenzo Guerini of Italy, and published under the auspices of the National Dental Association of America.

"Dental Materia Medica and Therapeutics." By Dr. Hermann Prinz, of St. Louis.

"Notes on Methods of Filling Teeth with Gold Inlays." By Dr. T. C. Trigger, of the University of Toronto.

"History of Dental Surgery, with Contributions by Various Authors." In two volumes. Edited by Dr. Charles R. E. Koch, Chicago.

"Modern Dental Materia Medica, Pharmacology, and Therapeutics." By Dr. J. P. Buckley, Chicago.

"Biographies of the Founders, Prominent Early Members, and Ex-Presidents of the Missouri State Dental Association." By Dr. Burton Lee Thorpe, St. Louis.

"History of the New Jersey State Dental Society." By Dr. Alfonso Irwin, Camden, N. J.

There are without doubt other works of much value deserving a place in this list, but they have not fallen into my hands.

So far as is known to your committee, only one new dental journal in English has appeared since the beginning of 1909, *The Dental Dispensary Record*, a bi-monthly, published in Rochester, N. Y.

Respectfully submitted,

A. P. LEE, *Committee.*

Dr. KRATZER. I move that the report of the Committee on Dental Science and Literature be accepted, with the special thanks of the society for the painstaking care shown in its preparation.

Motion carried.

The Committee on Oral Hygiene and Public School Dental Education was next called upon, and the chairman, Dr. GEO. S. SCHLEGEL, made the following report:

REPORT OF THE COMMITTEE ON ORAL HYGIENE AND PUBLIC SCHOOL DENTAL EDUCATION IN PENNSYLVANIA.

The members of the Committee on Oral Hygiene and Public School Den-

tal Education of the Pennsylvania State Dental Society were located in distant cities; in consequence of this fact no meetings were held. The committee, however, was admirably located for work, and has accomplished more good than may appear from this report.

The committee laid its groundwork along educational lines. On February 7th a letter was addressed to every superintendent of schools, both city and county, throughout the state. This letter contained an argument showing the great necessity of preserving the teeth in order to preserve health and consequently happiness.

We quote the further purpose of this letter:

(1) To bring to your attention the necessity of teaching practical oral hygiene in the public schools.

(2) The necessity of having a systematic inspection of the mouths of the school children.

(3) Your assistance and co-operation in establishing dental clinics in your locality for the school children of the poor.

(4) To make inquiries from you on this subject, the answers to which will serve as a guide for the Pennsylvania State Dental Society to co-operate for the oral welfare of the public school children throughout the state of Pennsylvania.

A copy of an editorial on "The Dental Inspection of Public School Children," from the DENTAL COSMOS for October 1909, was inclosed with the letter, to elucidate reasons Nos. 1, 2, and 3. The letter furthermore enlightened its readers as to the wonderful results obtained along this line of work in foreign countries, also as to what advancement has been made up to this time in the United States.

The questions we requested the superintendents to answer are as follows:

(1) Do you think the conditions of the mouth and teeth of sufficient importance to the general health to give them special attention in the public school room?

(2) Would you welcome trained men to lecture to your school teachers periodically on practical methods as to how to teach children oral hygiene?

(3) Have you had regular systematic inspection in the public schools under your supervision?

(4) Would you allow reputable dental practitioners to make systematic inspection of the mouths of the children under your charge?

(5) How much time are you willing to give to the children, either daily or semi-weekly, to receive instruction in the proper use of the tooth-brush?

We received twenty-four replies, certainly not a very large number considering the fact that we had addressed 162 superintendents. Although lacking in number, the character of the replies received was so encouraging that we believe these twenty-four replies can be taken as the consensus of opinion of the principal educators in this commonwealth.

The replies to question No. 1 were all in the affirmative, likewise those to question No. 2, with the exception of three who claimed that the board of control decided such matters, but in all probability would sanction such methods. Only two out of the twenty-four have had dental inspection; not any had regular and systematic inspection. Thirteen were willing to have systematic dental inspection, eleven were not prepared to give their opinion, but were satisfied that their respective boards would consent to such inspection. The fifth question was answered in various ways; they showed the willingness of the authorities to grant from five minutes once a week to twenty minutes daily for instruction in the proper care of the teeth and the proper use of the tooth-brush.

In short, the principal educators of our state are waiting with open arms to receive dental education for the school children from the dentists or the dental societies. Two questions now arise: Are we willing to give it? Are we prepared to give it?

In reply to a request sent out by the chairman of this committee to its members to present a full report not later than June 10th, Dr. D. S. Gardner of Scranton, of this committee, wrote: "We have made some progress in our locality

in oral hygiene and public dental education. A number of school teachers have been giving a portion of the day to teaching their scholars the use of the toothbrush and the importance of oral hygiene, and it is our aim to have this subject taught in all the schools throughout this valley.

"Dr. E. J. Donnegan of this city has given two addresses before the Women's Club on the importance of oral hygiene.

"Dr. Harry Beck of Wilkes-Barre has taken up the work with the board of education of that city.

"Dr. D. B. Williams of Wilkes-Barre has read a paper on the importance of oral hygiene before the Luzerne and Lackawanna Medical Societies, which was very favorably received by the medical men of both societies. He also states that a public dental dispensary is to be established in the near future."

Dr. J. A. Standen of Philadelphia reported conditions in his vicinity at a standstill.

Dr. P. B. McCullough, however, chairman of the committee in charge of the dental dispensary organized under the department of Public Health and Charities, wrote the following letter:

City Council appropriated $1000 two years ago. Last spring $2500 was appropriated. About $1000 has been spent for a complete outfit for three chairs. Two rooms in City-hall have been furnished for our use; this includes washstands, spittoons, and electrical connections. We will commence work in September with about 100 volunteers. Arrangements are now being made to give the committee the right to make examinations in the public schools and designate the children who shall receive attention at the dispensary. A distinctive feature of our organization is that it is under a department of the city government.

Dr. C. S. Van Horn of Bloomsburg, chairman of the Oral Hygiene Committee last year, reported increased activities since last year's report, with bright prospects for illustrated lectures to be held during the next school term in the schools of his county.

Dr. W. L. Fickes of Pittsburg reported the work of an educational character done in his locality during the past year. He states that "A considerable amount of the work was done by volunteers, who made examinations of two public schools and one parochial school." The report is as follows:

Franklin School.

Pupils examined	367
Teeth so neglected as to necessitate extraction	829
Teeth abscessed	46
Mouths in perfect condition	1
Diseased teeth	1812

Letsche School.

Pupils examined	365
Teeth needing immediate attention	1097
Pupils who had visited a dentist	5
Pupils who used a tooth-brush	3
Mouths in good condition	8

The Pittsburg *School Bulletin* contained articles calling the attention of teachers and school boards to the importance of public school dental education. Several papers were read before public meetings, which were instrumental in arousing public interest in the work. We have been assured that at no very distant date we will have dental attendants in two of our public schools.

During the past year the Pittsburg member of your committee has been ably assisted in his work by the Committee on Oral Hygiene and Public School Dental Education of the Odontological Society of Western Pennsylvania, Drs. Biddle and Crawford, by Dr. H. E. Friesell, member of the National Committee on Hygiene, and by Drs. Leslie Waddell, L. B. Moore, O. M. Sorber, and others.

At the last meeting of the Odontological Society of Western Pennsylvania, on motion it was resolved that a section on Oral Hygiene be formed for the object of charity, education, and public hygiene. This section now has thirty members, and it is proposed that a compaign of public education be inaugurated in the fall. It is the intention of the executive board that this campaign shall be conducted in as quiet a manner as possible, and yet with vigor and dili-

gence. It is also intended that the section shall work in conjunction with the state Committee on Dental Hygiene.

The chairman of this committee wishes to make a report for his county. The good work was begun on October 30, 1909, when E. C. Kirk, D.D.S., Sc.D., lectured on "Disabilities of Dental Origin in School Children," before 300 teachers at the teachers' institute of the Reading school district. Interest was immediately aroused. The superintendent of schools soon afterward invited the Reading Dental Society, through the authority of the sanitation committee of the board of control, to make an inspection of all the school children in the first eight grades of the city of Reading. The Oral Hygiene Committee of the Reading Dental Society, consisting of Drs. H. W. Bohn, chairman, C. B. Grim, G. F. DeLong, R. F. Schealer, and E. W. Mentzer, together with the Free Dental Dispensary Board, composed of C. V. Kratzer, chairman, H. W. Bohn, C. R. Scholl, W. D. DeLong, and G. S. Schlegel, secretary, immediately formulated plans whereby such an examination could be conducted. Each able and resident member of the society, twenty-six in all, agreed to take his *pro rata* share of pupils, and after a most arduous task the oral hygiene committee reports the conditions found as follows:

Pupils examined	8925
" with greenstain	5910
" " abnormal gums	925
" " tartar	1886
" " abnormal occlusion	1554
" " atrophy of teeth	308
" who are mouth-breathers	236
Cavities in permanent teeth	28,548
" " deciduous teeth	14,707
Putrescent pulps	1894
Exposed pulps	1717
Permanent teeth extracted	1094
Pupils who use tooth-brush	4849
" " had previous dental work	1369

The effect of this inspection on the general public was good. Duplicate charts showing the condition of the child's teeth were sent to the parents. The dentists of this community will testify to the fact that there has been a wonderful increase in the demand for dental services for children. The Reading Free Dental Dispensary, which up to the time of the dental inspection was only comfortably supplied with patients, is now overrun with patients, appointments being made six weeks in advance. These patients are all deserving, and would never have the means to save any of their teeth. The report of the dispensary for the year ending June 1, 1910, which represents the first year of its existence, shows that 176 patients were treated, and 1527 operations of various character were performed.

The board of education of the city of Reading distributed a pamphlet on which is printed "Ten Dental Truths for the Care of the Teeth," the work of the oral hygiene committee of the Reading Dental Society. These simple questions and answers are supposed to be read to the scholars at regular intervals. This is bound to have a far-reaching effect in the near future.

We believe that school inspection coupled with proper dental education will do more than anything else to bring to the front the necessity for the care of the teeth. We also believe that more accurate results can be obtained from examinations made by one dentist rather than a number of dentists. Therefore, a bill should be introduced into the next legislature empowering the State Board of Health to appoint dental inspectors for the various districts throughout the state; also, that such inspectors be appointed from a number which should be elected by the State Society, from its own body. Furthermore, an ample appropriation should be asked from the state by the Board of Health, to cover the expense connected with conducting such an examination. The results of such examinations will force upon the minds of thinkers the necessity for better means to take care of the most important part of the alimentary canal.

It might be a little premature at this time to consider methods by which the school children of the poor could receive proper attention. We would suggest that the different state hospitals which are now

receiving or will receive state aid in the future should have a sufficient amount included in this appropriation to establish and maintain a dental dispensary and to pay a salary to a dental interne, who would serve the institution and the public in the same relation as the medical interne.

The committee received sufficient information to warrant such recommendations as have been made in this report. The State Board of Health and the State Board of Education are in hearty sympathy with the movement of the Pennsylvania State Dental Society to secure proper and sufficient means to educate the people of this commonwealth in the importance of the cleanliness of the oral cavity, and to help to procure financial means to further these ends.

Only one more word: Is the dental profession ready to accept this great opportunity?

Respectfully submitted,

G. S. Schlegel, *Chairman,*
C. S. Van Horn,
W. L. Fickes,
J. A. Standen,
D. S. Gardner,
Committee.

Dr. Spencer. I move that the report be accepted, with the thanks of the society for the efficient manner in which the committee has done its work.

The motion was carried.

The next order of business being the President's address, Dr. C. C. Walker, vice-president, was called to the chair and Dr. W. D. DeLong read his annual address, of which the following is an abstract:

President's Address.

Mr. Chairman, fellow-members and friends of the Pennsylvania State Dental Society,—It is with a feeling of profound gratitude for the honor conferred upon me a year ago by my election as president, the highest honor which this association has to bestow, that I greet you and bid you welcome to this, the forty-second annual meeting.

In order that this meeting may be recorded in the history of our society as a successful one, the proceedings must be interesting, harmonious, and helpful. In the evolution of dentistry from the erratic itinerancy of early days to its present high status, this society has been no mean factor. Much if not most of what we have in the form of organization, legislation, and education in this state, which are the guide-posts of professional progress, had their conception in and received the fostering care of this society during the forty-one years of its history. Much is yet to be done. If loyalty and fidelity to the lofty principles and purposes as formulated by the founders of this society, and as laid down in its charter, continue to be the watchwords of the present and future generation of members, then the golden era of this society and of the dental profession of our state will come in the future. To the degree that these principles are departed from, and self-aggrandizement and other sinister motives are substituted, will our progress and efficiency be retarded, our general recognition delayed, and our claim to being a noble and learned profession questioned.

public service.

Someone has said that the nineteenth century has made the people of the earth neighbors, but the twentieth century will make them brothers. Society seems to be thrilled by a new-time power, an infectious sentiment, which the Germans fittingly call *Zeitgeist.*

The legal profession is changing its method of juvenile court proceedings; the medical profession is fighting with united power for the prevention and cure of tuberculosis, the church is aroused by the laymen's missionary movement.

During the past few years, and especially the last one, there has been evident to a remarkable degree a sweep of public-service enthusiasm in the dental world. The altruistic spirit is preparing the profession for a great forward movement. Dentistry is as yet to a vast number of people an "unappropriated blessing."

That our profession, which in a large degree represents preventive medicine, may come to its own, and that it may fulfil its mission more effectually, free dental dispensaries are being established, public school dental inspection is being instituted, public lectures are being delivered, and oral hygiene is being popularized. Educators are becoming intensely interested in this phase of our work, and are giving privileges and encouragement to those engaged in this most laudable undertaking. It is especially gratifying to know that our state superintendent of public instruction is in hearty accord with this movement, as is evidenced by his reference to the subject in his addresses and published articles.

I do not wish to anticipate what the Committee on Oral Hygiene and Public School Dental Education will say in their report. I know, however, that they have not been idle, and we can feel sure that their report will be interesting and their suggestions such as this body should seriously consider. In the furtherance of this propaganda we should, however, be careful not to sacrifice discretion to zeal —not to permit our enthusiasm to run away with our better judgment.

LITERATURE.

The most valuable acquisition to our literature during the past year is undoubtedly Guerini's "History of Dentistry." It should be read by every member of the profession. It marks an epoch in the history of dental literature, and the author and his collaborators deserve the gratitude of all. The preparation was a herculean task. It is to be regretted that for the want of a sufficient number of advance subscriptions the publication of this work was delayed. In fact, only after repeated solicitations for subscriptions was the committee enabled to have the work published—which is rather a reflection on the literary propensity of our profession. A resolution by this society expressing our appreciation of the author's work, as well as of the labors of the committee of the National Dental Association, should be passed and delivered to the parties who so unselfishly gave of their time and energy to bring this work before the profession. While our journals contain many articles of scientific merit, and other matter helpful to their readers, there seems to be a tendency on the part of some of them at least to give undue emphasis to the commercial or business side of dentistry.

STATE BOARD EXAMINATIONS.

The question of graded or divided examinations by the State Board of Dental Examiners was on former occasions brought to the attention of the members of this society. At least two of my predecessors in office recommended a change in the present method of conducting examinations of applicants for license to practice dentistry in this commonwealth; again, last year, in the discussion of a paper before this society, the matter was referred to and strongly advocated. I have personal knowledge that a division of the examinations was favorably discussed by former members of the board of examiners. While the subject was before this society on former occasions it was not given the consideration which its importance merits. I am not informed whether a change, from a single examination in the fifteen subjects, as provided in our dental law at the close of the college course, to giving permission to the students to take the examination at the end of the first and second years in those branches successfully passed in college, would be welcomed by the dental schools and the student body. While these two parties are vitally concerned in this matter, the protection of the public from incompetent practitioners is of primary importance. If this protection of the public is maintained or made more secure, and at the same time objectionable features are removed by a change of method, then the change should come. The motive for the advocacy of a divided examination is not to make it easier for the candidates to pass. In every class examined by the board a number fail, and fail repeatedly, giving evidence either of a lack of preliminary

education or want of application during attendance at college. The aggregate of those who fail in the several states is quite considerable; especially is this true in those states where the boards are carefully safeguarding the public. This failure works a hardship upon the young men who spend their time and money in a three years' course in college. A divided examination would weed out at the end of the first year many of those who should never have entered upon the study of dentistry. It would also be an incentive to those competent to study dentistry to apply themselves more closely to those branches taught in each year, thus obtaining a more thorough knowledge of the branches of the year, and do away with the pernicious custom of cramming for the examinations during the period between the close of the college course and the board examinations. It would also to a large degree remove the phantom of board examinations which seems to haunt a large portion of students from the beginning of their course of study until after the examinations are over and the result is announced. It has been asserted that a candidate for license should demonstrate to the state his fitness to practice at the time he enters upon such practice. To this dictum we all subscribe. The crucial test of a man's ability to practice is perhaps best shown by the material evidences of his work done while in college and in the presence of the examiners, as well as by his papers on the principles and practice of operative and prosthetic dentistry. It is highly important that students be thoroughly instructed in the other subjects of the dental curriculum, but it seems of little moment whether the test of their knowledge of the fundamental branches, anatomy, physiology, chemistry, etc., be made before or at the time of their entrance upon practice. The state demands only one satisfactory demonstration of their knowledge of any of the subjects required for license. It should make little difference whether this demonstration is made one year or two years before, or at the time of graduation from college. It makes little difference whether what they forget—and we all forget—be forgotten a year before or a year after licensure. A subject once mastered, although many of the details may be forgotten, will leave its impress.

It is the conviction of your president that a change in our dental law governing state board examinations along the lines suggested would bring credit to the profession of our state, raise the standard of examinations, and work no hardship upon any, with the exception of giving additional work to the members of the Board of Examiners and to the secretary of the Dental Council.

Motion was made and carried that the President's address be referred to a committee of three for consideration, and the Chair appointed as such committee—Drs. J. G. Lane, W. L. Fickes, and H. W. Arthur.

Motion was then made and carried to adjourn until the afternoon session.

TUESDAY—*Afternoon Session.*

The meeting was called to order on Tuesday afternoon, June 28th, at 2.30 o'clock, by the president, Dr. W. D. DeLong.

The first item for the afternoon session, as announced by the President, was the reading of a paper by L. F. FLICK, M.D., Philadelphia, entitled "Tuberculosis: Preventive Measures for the Protection of the Dentist and His *Clientèle.*"

[This paper is printed in full at page 1332 of the present issue of the DENTAL COSMOS.]

Discussion.

Dr. GEO. C. STOUT, Philadelphia. I only became aware of the fact that I was to open the discussion on this paper when I saw the program this morning for the first time. I thought then, however, that the subject would be presented to you thoroughly and in a finished manner by Dr. Flick himself, and he has so fully justified my expectations that he has left little for me to add in discussion.

In the first place I wish to congratulate Dr. Flick on the clear-cut manner in which he has presented the subject to you. Many of the points he has brought out are more or less familiar to us, but he has presented them in a new and clearer light, and has given us many new ideas of practical value.

Some details as to surgical cleanliness might be further elucidated. The first and most important point is the one of running water, which should always be close at hand so that the operator may frequently wash his hands and face. The patient may be covered with a sterile sheet, or sterile cloth, which would catch infectious materials. The surgeon should change his outer clothing frequently, having suits for alternate days, and having them aired in the interval. Or, better still, he should wear washable clothes, capable of easy sterilization. A cuspidor with running water attachment is now regarded as indispensable, and should be used by all patients in expectorating, and sterile handkerchiefs or napkins should be furnished each patient.

One might go a step farther, and have markedly tuberculous subjects come at a time when there are no other patients in the office; individual sputum-cups could not be passed around one's waiting-room without scaring everybody out of the office.

A sterilizer at hand on the table, ready to receive each instrument after use, is also indispensable. Of course the operator does not or should not use instruments a second time without boiling them. In my own practice, in treating tuberculous or syphilitic patients, I have an entirely separate set of instruments for each individual, and no other patient is touched with these instruments until that individual is finally discharged and the case is completed.

Another precautionary and protective measure is the movable plate of glass devised by one of our *confrères,* which is so arranged between the patient and the physician as to permit the latter to work under the glass, which protects him from any contagious material ejected from the patient's mouth. It is also essential to have sprays and gargles for the patient ready for use, and if I dare mention a proprietary article, I would suggest that listerine is a very practical and useful antiseptic to have on hand.

With these precautions the operator can protect his other patients and himself as well. But better than any of these suggestions is the fact brought out authoritatively by Dr. Flick himself, that the danger of contagion in these cases is remote save in certain special contagion-carriers.

Dr. I. N. Broomell, Philadelphia. It is a somewhat difficult task for one not having a general medical education to attempt to discuss a paper such as that which we have heard today. This task becomes especially difficult under the present conditions, because we all recognize Dr. Flick as an authority on this subject, and we have noticed also that the first gentleman to discuss the subject is equally well posted. For these reasons my remarks will be brief.

I believe that the dentist in the past as well as at the present time has felt satisfied that there is little or no danger of tuberculous infection through patients suffering from this malady. We have been inclined to believe what the medical books tell us, viz, that while tuberculosis is an infectious disease, the possibility of contagion is very slight. We have recognized the fact that while the disease is readily transmissible from one domestic animal to another, it is only in rare instances transmitted from one human being to another. Dentists in general have contented themselves with this understanding of the matter. After Dr. Flick's authoritative statements, however, it seems to me that the time has come when we should be more careful. Speaking from the dental standpoint, I have never heard that tubercle bacilli may be found in carious tooth structures. Miller and other authors, however, state in their writings that there is a possibility of tuberculous infection by way of the mouth indirectly from carious teeth, owing to the fact that they may cause abraded surfaces through which the tubercle bacilli may enter.

These investigators also state that this is particularly possible in young children, in whom infection occurs nearly always by way of the glandular tissue. I do not know Dr. Flick's opinion regarding infection by inhalation, nor whether it is possible for the dentist to become inoculated in that way. I think, however, that Dr. Flick will tell you, in closing the discussion, that there is little possibility of infection by inhalation. I have always believed that there is less possibility of infection through the mouth than by any other channel. I believe this to be due to the usual presence of a normal saliva which acts as a protecting medium.

I would like to ask the essayist as to the possibility of infection without an abrasion—whether the mouth in a normal condition would be open to infection readily, or at all, if there is no abnormal condition, particularly in the way of wide-open lymphatic vessels or abrasions caused by carious teeth?

Dr. G. F. DeLong, Reading. Dr. Flick has done more for the prevention of tuberculosis by the spreading of knowledge pertaining to it than any man in the medical profession.

I am very sorry that I could not have a copy of Dr. Flick's paper before the meeting, as perhaps I might have been able to comment upon it more intelligently. For the past two or three years I have been watching the obituary notices in the dental journals, and I have observed that a great many of our *confrères* are victims to tuberculosis. I believe a greater percentage of our profession die from tuberculosis than from any other disease. This is most likely due to the environments in which we work.

The remark of Dr. Broomell as to whether it is possible for the dentist, or any person, to become infected through inhalation brought to my mind an item which I read about a year ago. A medical man made extensive examination in this field, and discovered that the mucous secretion of the nose is germicidal. He made further experiments with mucous secretion taken from different persons infected with tuberculosis, and obtained in a very small percentage of cases cultures of tubercle bacilli. That being the case, every dentist should take the precaution of breathing through the nose.

The dentist can and does to a great extent spread knowledge concerning the prevention of tuberculosis through the public dental instruction that he is giving at the present time, and through the public dental dispensaries, which are putting the mouths of patients in a more sanitary condition, so that when we treat patients now, we are less likely to be subject to infection.

In regard to our *clientèle,* I think the proper method for us to pursue is to have a separate set of instruments for the tuberculous among our patients. I have noticed that some dentists have a separate set of instruments for this class of people, and never use these on any other patient without thorough sterilization.

Dr. Flick's paper is very optimistic. I always imagined the danger of infection with tuberculosis to be greater than he has pointed it out to be. I never conceived that washing the instruments and the hands simply with soap and water would be sufficient for removing tuberculous germs. I always thought that cleaning the instruments as well as the hands was a great deal more difficult than the essayist has stated it to be.

Dr. E. T. Darby, Philadelphia. I have been profoundly interested in the subject-matter of the paper, and greatly pleased with the able way in which Dr. Flick presented it. He has gone into the subject in a most practical way. I had supposed that the dentist was subject to more or less danger from tuberculous patients. We probably do not always recognize tuberculous patients. I do not recall having treated one in the past five years, and yet I may have had a great many during that time. It must of necessity be true that during the past forty years I have seen many tuberculous patients.

It has been said that the dentist is especially liable to tuberculosis, that the position which he occupies at the chair is favorable to infection, that his en-

vironment is bad, that he is confined to the house much of the time, and that he is thereby rendered more or less susceptible to infection from tubercular germs. I have no doubt that this susceptibility is one of the reasons why dentists very frequently contract the disease and succumb to it. I have never thought that I was personally subjecting myself to the dangers of the disease, although undoubtedly I was. At the age of twenty-three I had a severe hemorrhage, and was sent to Egypt to get well or to die. I went through the desert of Arabia and returned weighing one hundred and eighty-four pounds, before that having been reduced to one hundred and forty pounds. Whatever tendency I had then I probably overcame by living in the open air and under favorable conditions. I am not sure even at the present time that I shall not yet die of tuberculosis, but the fact that I have lived forty years since then, and have been standing nearly every day at the dental chair, has encouraged me to believe that I have in a measure become immune to that disease.

We dentists are surely indebted to Dr. Flick for this paper. He has presented a subject to which we should devote special and earnest attention, not only because it affects us individually but because it affects our *clientèle*. We should consider our patients as much as we consider ourselves. There is no other disease that we could transmit, unless it be a "specific" disease, the effect of which would cause us greater sorrow, if we have any conscience at all.

Dr. E. A. Bogue, New York, N. Y. I am hardly the proper person to be called upon to discuss this subject. Dr. Darby's remarks brought to my mind a statement which I heard not long ago from a gentleman who has charge of the dead-house at Bellevue Hospital, New York, *i.e.* that ninety-five per cent. of the cases on which he had made an autopsy exhibited signs of having had tuberculosis at some stage of life. This shows us the tremendous extent of the infection, and also our tremendous fund of resistant power.

The second speaker's remarks brought to my mind a statement made by Dr. DeLisle, and referring to a surgeon who, after carefully washing his hands and scraping under the nails until the fingers almost bled, assisted in placing the patient on the table by putting his hands in the axillæ—and then began to operate! Ordinarily the sanitary condition of the axilla is hardly one of scrupulous cleanliness.

The idea of having two sets of instruments, which are in the sterilizer and boiled for fifteen minutes before being used again, is all very well. I have two sets of instruments myself, but I intend to discard one set, because I do not often work on the soft tissue, and do not need to sterilize the handles of my instruments, to say the least. Absolute cleanliness as far as possible, and as described by Dr. Flick, has always been my practice, and I also agree with him in the view that by means of absolute cleanliness of our hands and instruments we may protect ourselves against infection.

Dr. Broomell's statement in regard to infection seems to imply that, if the dentist has a normal breathing apparatus, infection cannot occur from the living patient to the dentist, that is to say, dry particles emanating from the patient would not be inhaled.

Dr. W. J. Roe, Philadelphia. I consider this paper most opportune and most valuable, and I fully concur with Dr. Flick. As Dr. DeLong commented, the essayist has shown a most optimistic attitude toward tuberculosis. My experience has been that infection is very common, and more frequent than the dental or even the medical profession have any practical conception of, infection from pulmonary sources affecting local lesions and the oral tissues. I would suggest that every member of the dental profession read over the essayist's paper thoughtfully and carefully, which will surely be of great practical benefit both to himself and his patients. The only objection that I could raise to the paper is that Dr. Flick has represented the danger as being very small.

Dr. W. L. Fickes, Pittsburg. I wish to compliment Dr. Flick on his most valuable and opportune paper. There is only one point on which I wish to speak. From my own experience and that of others I am confident that many cases of alveolar abscess which seem incurable are tuberculous, and it would be well for us to have such cases examined to determine the character of the bacteria present.

Dr. C. B. Bratt, Pittsburg. I would like to ask Dr. Flick why, in cases where we find people, for instance husband and wife, who have lived together during the entire course of this disease, the wife, say, may die of consumption, while the husband never contracts it, although no sterilizing precautions whatever have been taken? We know the tendency may be inherited, and a child born of such parents, when conditions are favorable, may develop tuberculosis, yet on the other hand people live in the same house, and eat from the same dishes, never taking any of the necessary precautions of sterilization, without imparting the disease to one another.

Dr. Flick (closing the discussion). Strangely exaggerated statements are being circulated, coming sometimes from authorities who are supposed to know better, about the intense contagiousness of tuberculosis. First of all it is important to recognize that tuberculosis cannot be contracted except from a person who is tuberculous; in other words, tuberculosis cannot arise except from a preceding case. Another important fact to keep in mind is that tuberculous contagion is a kind in itself, and must not be measured by the contagion of smallpox, measles, scarlet fever, and similar diseases. If we study the character of tuberculosis and the manner in which it is spread, and keep in mind that it can only be transferred from one patient to another, we will take a good commonsense view of how it is spread, and how great the danger of infection really is.

Consequently, while tuberculosis is contagious in the true sense of the word, for a new case cannot arise without a preceding one, yet, since the tissue in which the bacilli are located has to break down before the bacilli can get away, and since the bacilli must be carried in the broken-down tissue itself, the contagion in the nature of things is very slow. It is not as in that of smallpox. An individual can be closely associated with a consumptive without contracting the disease; husband and wife may live together and one may have the disease, while the other remains free from it. One wife may outlive two or three consumptive husbands, and still not contract the disease herself. There is good reason for this. Everyone has his or her measure of immunity. That measure of immunity can be increased in the individual from generation to generation, so that the child of a consumptive father and mother, if it is conceived after the father and mother have had tuberculosis, is less susceptible than the father or mother were, and the grandchild will be less susceptible than that child, and so on, until finally there may be complete immunity. There is a large number of people who enjoy complete immunity against the mortality of tuberculosis, although not against its morbidity; that is, they may have tubercle bacilli in their tissue but do not die thereof. Hundreds of people have tuberculosis from childhood to old age, and hardly know it. Tubercle bacilli may grow in their tissue without poisoning them, and hence they do not develop noticeable symptoms. A wife may die of tuberculosis, and yet the husband may not contract it in a fatal form, but may have it only in latent form to old age. He may be so immune that the tubercle bacillus will not affect him, which, however, does not argue against the contagiousness of tuberculosis. We are dealing with a disease having its own special character, and must not measure it by other diseases.

The breath of a consumptive is not contagious. In other words, the air which he exhales is not dangerous except when it carries off broken-down tissue—and therein lies the crux of the whole subject. Contagion of tuberculosis is necessarily confined to broken-down tissue. The tubercle bacillus grows in tis-

sue and not on tissue, and the tissue must break down before the bacillus can be transmitted from one host to another. A man may himself be full of tubercle bacilli and not be contagious because he does not give them off, yet the habitat where he does give them off may become so contaminated that it may readily become the source of a new implantation. For this reason there is little danger in the dental office unless there is gross uncleanliness. When we consider that people can live day in and day out in the homes of consumptives, which are intensely contaminated, and sleep there, without contracting the disease, we realize that the necessarily small contamination which can take place in the dental office within a few hours can scarcely be expected to produce new implantations. As a matter of fact, out of every five people who are exposed to what we call a competent contagious environment, only one contracts the disease in a form that proves fatal. If that is so in the home of the consumptive, it must be very difficult to contaminate the dental office in such a way as to make that office a serious source of danger. The consumptive himself is absolutely non-contagious, provided he does not deposit any tissue which will contaminate his clothes or the place where he lives and sleeps. Therefore every dentist can control the environment of his own office, if he has the courage to insist that all his consumptive patients do what is necessary to avoid contaminating the office. As I said before, the serious danger lies in the dentist's taking the sputum from the consumptive's mouth with the fingers or instruments and conveying it in some way to his own mouth or those of his healthy patients. A great many dentists have careless habits, and put their fingers in their mouths unconsciously, and sometimes they may do so when their fingers are contaminated. The man who avoids contamination through contaminated hands, and sees that his consumptive patients do what is necessary, may practice dentistry in consumptives for a whole lifetime without any danger of his contracting tuberculosis.

An abrasion in the mouth will become a source of local tuberculous infection of the glands of the neck, if enough tubercular matter is brought in contact with that abrasion, and, of course, in practical life that is not apt to occur. Children, however, sometimes in crawling over the floor pick up objects and put them in their mouths, which may lead to infection of the glands of the neck. That is probably the way in which many cases of tuberculosis become first implanted. Recently many scientists have come to believe that most cases which terminate fatally in after-life were implanted in childhood, because children in the home of a tuberculous mother have much opportunity of contaminating themselves. In the dentist's office, however, this is not a serious problem, because it is not likely that the two factors necessary for implantation, an abraded surface and tubercular matter, would occur in unison there.

Dentists frequently do die of tuberculosis, I am sorry to say. I have had the misfortune of seeing some die. There are other factors which enter into the problem, besides the possibilities of contamination in the dentist's office. The kind of life which the dentist leads is somewhat predisposing to tuberculosis, and in his surroundings, his family life, and social environments he may be exposed to contagion. On account of the life which he leads and his consequent predisposition to the disease, the dentist may contract tuberculosis more readily than other people who lead a different life. Dentists may infect themselves by inoculation, not realizing the difference between scientific cleanliness and ordinary cleanliness. They may put objects in their mouths unconsciously, such as instruments that have become contaminated, or they may put their contaminated fingers in their mouths.

All the tubercular matter which may attach itself to an instrument can be washed off with soap and water. The soap dissolves the matter, the water washes it off, and of course there is no infectious matter left and no possibility of implanting the disease. For the same

reason the ordinary washing of dishes in the house of a consumptive is sufficient to protect others. People sometimes subject the poor consumptive to hardships, such as having separate food and separate dishes, which are disinfected after use. This is unnecessary, as has been proved scientifically. All that is needed is absolute cleanliness of the instruments, as well as the dishes, and when these have been cleansed properly they cannot be a source of contagion to others.

I have no doubt that many unrecognized cases of tuberculosis come to dental offices, but the dentist may feel fairly sure that any unrecognizable case of tuberculosis is sufficiently non-contagious not to be a source of danger.

The statement that ninety-five per cent. of people who die have had tuberculosis is of course exaggerated, as it comes from men who are examining cases from hospitals and from almshouses. There is quite a difference between the mortality from tuberculosis among poor people and well-to-do people. We must also consider that the men who claim this high percentage often count scars which they presume to have been caused by tuberculosis. Probably a much fairer statement would be that only from forty to fifty per cent. of the people who are implanted with tuberculosis develop this disease sufficiently to leave a scar.

The whole subject of prevention of tuberculosis in the dentist's office resolves itself into a question of cleanliness, *i.e.* a proper disposal of broken-down tubercular tissue which may be given off by the consumptive.

In conclusion, I wish to say that the truth inspires optimism in the tuberculosis problem. Let us correct our mistaken ideas of the contagiousness of tuberculosis which inflict such hardships on poor consumptives. I know it to be a fact that some dentists cannot permit consumptives to come into their offices, for the reason that should they treat the consumptive, other people will not come. It is the duty of the dental profession to properly educate the people and prove to them that the consumptive can come to the dentist's office without being a danger to other people, and that his exclusion is an unnecessary hardship, which is inconsistent with real facts.

(To be continued.)

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Forty-second Annual Meeting.

(Continued from page 1299.)

SECOND DAY—*Afternoon Session.*

President Nash called the society to order at 2 P.M. The minutes of the morning session were read and approved.

The Secretary called the roll of delegates and members.

Dr. N. S. JENKINS, Dresden, Germany, then read a paper entitled "The Progress of Dental Science and Art."

[This paper is printed in full at page 1321 of the present issue of the COSMOS.]

Discussion.

Dr. R. H. HOFHEINZ, Rochester, N. Y. What a task to discuss a paper of such comprehensiveness and enormity of latitude! I exclaim with Dr. Jenkins, "Who of all, brothers, has seen his work completed?" To the lines of Omar which

the essayist quoted in the introduction to his paper, I might add those of Goethe:

> All things have their issues
> That mortals try:
> We are here for a day
> To stamp on the clay
> A part of ourselves
> That never may die.

The introduction of the essay shows us that the same eternal law of evolution applies to dentistry as is found in every phase of the development of the universe. This might drive home the great fact to some of our dentists, that originality is a very questionable compound. People are always talking about originality; but what do they mean? As soon as we are born, the world begins to work upon us, and this goes on to the end. And, after all, what can we call our own except energy, strength, and will? Dr. Jenkins, whose wonderful personal ability has done more than that of any other man in making porcelain inlays a success, had to take his lessons from the specimens found in Etruscan tombs, which showed that these good people practiced the art over 2000 years ago in their own manner and for their own purposes.

There is nothing that I could add to the strictly historical data which Dr. Jenkins has given us. A wonderful utterance appears by Sir John Tomes, presiding over the meeting of the Odontological Society of London, of which I will quote only a few short sentences: "When a body of men are willing to abandon their own special views in favor of a common cause, and have acted in the spirit in which the College of Dentists have acted on the present occasion, it is not for us to scrutinize the past too closely, but it is for us to receive them with liberality, placing implicit confidence in the future. Before taking my seat I must protest against the general accusation of inferiority preferred against members of our profession. There are many practitioners, unknown to us, who hold as high a position in town and country as those who frequent this room."

These words, uttered in 1863, are as modern today as if they had been first embodied in Dr. Jenkins' paper, read at this meeting. We are, as a body, as unjust toward the men who are not members of dental societies as they were in 1863. The holier-than-thou air is most amusing when some prominent society dentist tells the patient that Dr. Jones' work cannot be of the best quality because he is not a member of such-and-such dental society. In the meantime he "stamps on the clay a part of himself that never will die." In that respect we have not progressed since 1863. But this is less a dental than a human question.

If the British law has failed to frame an act which shall not work individual injustice, but has developed a highly educated upper class of dentists, and a class able to do excellent technical work, it has only done what practically all European countries have achieved, more or less.

What applies to England regarding the "golden age of prosthetic dentistry," as Dr. Jenkins has termed it, applies with equal force to France, Germany, and Austria. I distinctly remember that when I was associated with Dr. Thomas of Vienna for a short time, twenty-seven years ago, we completed ten gold plates in one week. It is very doubtful whether ten gold plates are made in the city of Albany in any one year. More doubtful, however, remains the question whether there is any first-class practice in which patients require ten gold or other plates during any one year. There is the rub! and there is the great distinction.

We learn from this excellent essay that each European nation has developed dentistry in its own individual way, the same as we have. English dental development remains conservative, respects position, and honors scholastic training, and is unready to adopt foreign methods, though it may be self-respecting and sincere. It shows in dentistry simply what Great Britain has shown in its great commerce. It has been and remains insular. It held its own dental opinion as high as that of other sciences owing to its great national intellectual power. The

enormous commercial development which has taken place, particularly in the United States and Germany, has taught England that its lofty insularity, in this age of rapid changes, is out of place. England, which has given the world the greatest in literature, the greatest in science, the greatest in commerce, cannot fail to abandon conditions which applied to the past, but are becoming obsolete. England, which has given dentistry some of its greatest scientific thinkers, will certainly apply the same principle to modern dentistry in its conservative but positive way—yes, very likely, in its "Dreadnought" style.

If France represents anything at all, it represents brilliancy, originality, versatility, and daring. Everything in her artistic development indicates part of these attributes. The hundreds of thousands of ladies—sometimes not ladies—who promenade upon the Grands Boulevards, show brilliancy in their attire, originality, and daring. The entire civilized world has taken France as its pattern for style. This national trait must reflect upon everything, and it naturally shows itself in dentistry. It seems perfectly proper and congruous that the holder of a dental diploma in France should be punished if he practice medicine. It is slightly comical, however, that the medical man may practice dentistry though he has no specific dental training. This incongruity will not be solved until medical and dental education are completely unified.

Dr. Jenkins tells us that in no country has there been more striking progress in the last quarter of a century than in Germany. Again we have the same law of evolution applying to all things. The essayist informs us that in Germany modern dentistry is not a renaissance. This, however, applies more or less to all countries. Modern dentistry is only about eighty years old, and is too young to be renascent. Though Germany has been great in science and in literature, it has failed to do any marked service for dentistry. The powerful national impulse which was awakened during the Franco-German war had its tremendous influence upon its phenomenal development during the last thirty years.

Germany today, with a commerce second only to England and America, a navy second only to England, has simply given the world a lesson of what a great people can do if united, in spite of all geographical disadvantages. This phenomenal development must reflect itself upon all other things. It is particularly characteristic and pathetic that the great man who did more than any other to raise German scientific dentistry to its present standard, was called *our* Miller in Germany and *our* Miller in America. There are not many men in any profession whom two hemispheres claim as their own with almost jealous pride.

I can say less on the relative development of dentistry in the other countries, because my knowledge of them is not as comprehensive. During the fifteen years of my connection with college life I met many European dental aspirants. One I remember most particularly. He was an Austrian M.D., and was without a doubt one of the most cultured minds with whom I came in contact. It took him over a year before he could discriminate between a round and a square cavity, which simply shows that an intellectual training, be it ever so profound, will not suffice to make a good dentist if not properly combined with early manual training.

Among the three distinct European dental achievements, Dr. Jenkins speaks with special emphasis of the increasing public influence of the dental practitioner, a fact which is making itself most clearly manifested in the remarkable progress that is being made in establishing school dental clinics. These school dental clinics in Europe became at once, as of course with all nations governed by paternalism, municipal establishments.

In our own country of America, where all municipal affairs are governed by politics, and frequently the lowest, the distinction of having free dental clinics belongs to the dentists themselves. It is with special pride that I refer to our Rochester school free dispensary as the first one in America. For years we

had a free dental dispensary connected with our Health Association, which was largely supported by one of our great local philanthropists, Captain Henry Lomb, and the dentists. The school dispensary grew from the enthusiasm of our local dentists, and has thus far received its main support from the unselfish and magnanimous help of the Rochester Dental Society. The dental equipment, one of the finest to be seen anywhere, was contributed by different dental dealers at the earnest solicitation of our city society. The dispensary was opened on February 22, 1910, and I give a short report of the operations made to date:

REPORT OF DISPENSARY NO. 2, AT NO. 14 PUBLIC SCHOOL.

From March 1 to May 1, 1910.

Number of patients treated	182
Number of operations	439
Prophylactic operations	47
Number of treatments	73
Pulps devitalized	0
Total number of fillings	221
Amalgam	158
Cement	41
Gutta-percha	10
Root	11
Extractions	98
Roots	18
Teeth	80

No doubt the time will come when our municipalities will join with us in the support of our free dental service.

After the magnificent *résumé* of European dentistry, Dr. Jenkins may well intimate that we must guard our laurels with a jealous eye. We are subjected to the same national influence in our dental development that other countries have felt. A country which allows of an almost limitless development of the human being must admit of a dangerous expansion of any art or science. What do we find as a result? The finest dentistry, and the most hideous—a lady in the street car with the most delicate and skilful dental operations that can possibly be made by human hands, side by side with a man or woman with one or more shining gold crowns covering their front teeth. These paradoxical conditions are perfectly natural. The vulgar element which our country has to digest and assimilate is happy only in a vulgar display, be it dental or otherwise.

If we are to be the great melting-pot of human races, we must come forth from the crucible each time with less alloy. Dentistry has reached its highest scientific development in some of our American representatives; it has reached its highest artistic and technical development through the same channels. Our educational demands are greater today than they ever were, which means better structures on better foundations. Our American political and commercial life is undergoing a process of purification which makes better men of all of us. What is good at all must have its influence upon all branches of life, be it science or art. A country which has given the world the very best in dentistry cannot fail to profit by its own past and by the present of other nations.

The wonderful development of European dentistry can only serve us as a great stimulus, and it would be difficult to find a man who represents both developments with greater brilliancy than the essayist whose paper I have discussed.

It has occurred to me that Dr. Jenkins has said nothing about Russia, and I wish he might do so in his closing remarks. A country which has given a Tolstoi and a Turgenieff to literature, a Tschaikowsky to music, and a Metchnikoff to medicine, may some day give us a great man in dentistry. I think Russia today is one of the intellectual giants abroad, only now awakening.

It would be folly for us to pose as the only dentists in the world, and danger signals would soon be displayed. We must take the best from all and remain at the head of the profession—a distinction we deserve by our past and present achievements.

Dr. A. R. STARR, New York. Dr. Jenkins has sounded a note of alarm in stating that dentistry has reached a stage where, in order to make future progress, its votaries will require more elaborate and profound training, and qualities in which other nations may be our superiors.

He intimates that dentistry in America is about to come to a standstill because of lack of ability in scientific investigation, and that the foreign dentists are liable to go ahead of us on that account. The possibility of such a reversal of present conditions I believe is very remote. While there may be a growing tendency for the foreign dentists to improve dentistry from its scientific or theoretical aspect, we also have quite a few in this country who are working hard in the same direction. Until the average foreign dentist acquires the ability which he seems to lack, of making practical application of his scientific deductions, I do not think there is much danger of his gaining supremacy over the American dentist. I claim that American dentistry is not on the wane, and although we may not as a class justly lay claim to being scientific workers, we are eminently practical and seize every opportunity to utilize scientific principles to practical advantage. Who among the foreign dental practitioners of recent years can lay claim to more important discoveries in the science and art of dentistry than those of Wells, Black, Taggart, and Buckley? When we look over the names of foreign dentists who have made the most important recent contributions to the scientific side of dentistry, we note those of Miller of Berlin, Williams of London, Boedecker of Berlin, and Michaels of Paris, and it gives us pleasure to know that each and every one of them acquired his first knowledge of dentistry in America. Even our good friend Dr. Jenkins, who has done so much for dentistry abroad, is a native American. Who among the foreign dentists can lay claim to greater zeal in endeavoring to promote both the scientific and artistic sides of dentistry than that shown by such men as Black, Andrews, Truman, Abbott, Atkinson, Kirk, Bonwill, Barrett, Perry, Darby, Brophy, Cryer, Talbot, Angle, Kingsley, Buckley, Taggart, and many others we might mention in the same category.

The Buckley method of treating putrescent pulps is I believe one of the most important dental discoveries of modern times—a discovery, by the way, which was made not by accident, but because of a close study of the chemical and bacterial conditions involved.

The question of dentistry's being a specialty of medicine has been a matter of controversy for many years, in this country as well as abroad. There is no doubt that a medical training is of great value to the dental practitioner, but whether or not it is better for a dentist to take a full course in medicine in connection with the study of dentistry is still an open question. Most of us believe that dentistry is a part of the "healing art," but is it not true that the dental student of today in any recognized dental college receives as much instruction in the fundamental principles of the science of medicine as is requisite for the proper understanding and practice of his specialty? He is required to study general anatomy, physiology, histology, chemistry and physics, as well as special bacteriology, pathology, surgery, physical diagnosis, materia medica, and therapeutics.

It would seem as though the medical man is more in need of greater knowledge of dental subjects than is the dentist of a greater knowledge of medicine—for the average medical practitioner is sadly deficient in his understanding of dental lesions. Fortunately, however, the medical man is now beginning to realize his lack of dental knowledge, and is more often referring his patients to the dentist for advice and treatment. The dental profession is to be congratulated on having built up such a reputation as it has done, without the help of the medical profession. While dentistry, no doubt, should be considered a branch of medicine, it is by no means a small one, for it has almost as many specialties within itself as has the parent profession; and inasmuch as we treat other tissues as well as the teeth we should really call ourselves stomatologists rather than dentists. We now have oral surgeons, operative dentists, prosthetic dentists, orthodontists, extraction specialists, pyorrhea specialists, and no doubt other specialties will arise in the future with a more advanced knowledge in our professional field.

It would be as needless to make the medical student take up all those branches as it would to make the dental student study obstetrics or gynecology. Medicine and dentistry, while so closely allied, are still so widely divergent and each so comprehensive that the time hardly seems ripe for a union of the two. I do not desire to depreciate the M.D. degree, for I appreciated its value well enough to obtain that degree before finishing my course in dentistry, but with the present plans and scope of teaching dentistry I question the advisability of making it obligatory for the dental student to obtain the medical degree. I understand that such a course is recommended by the dental profession of the state of Virginia, and that ways and means are being devised to make it compulsory in that state for the dental practitioner to obtain the medical degree. In my estimation the present system of separate teaching, modifying it by endeavoring to teach the dental student more medicine, and the medical student more dentistry, is still the best solution of the problem. This may necessitate the devotion of more time to the study of each profession, but as far as dentistry is concerned I believe it will give us better dental practitioners, since we can begin earlier and spend more time in the teaching of the dental technique which is so essential to a correct application of theoretical knowledge. If allied with medicine, dentistry would have to be taken up as a postgraduate course, and should require a special degree guaranteeing the fitness of the graduate to practice that specialty. This would necessitate a course of study covering a period of at least six or seven years; and while such a course would undoubtedly give us broader-minded and more scientific dental practitioners, it is questionable whether the delay in acquiring manipulative ability might not seriously and permanently hamper the man in attaining perfection in that very important qualification. Again, it seems as though it would be an unjust discrimination against the person in moderate circumstances, for only the well-to-do could afford the time and expense to carry out such a course.

The profession of dentistry is not as yet overcrowded, and if we are going to exercise a modicum of altruism, we must look at the question from the standpoint of the laity as well as from the standpoint of the one who is on the inside and upon whom this measure would have no detrimental effect. How many dental practitioners would clamor for a law making it compulsory for the dentist to acquire the M.D. degree if that law were made retroactive and would apply to those now in practice? There are not at present enough good dentists to take proper care of the teeth of the population in this country or abroad; and if we restrict the output to such an extent as some propose, it might react seriously upon the comfort and well-being of the masses.

The proper remedy would seem to be along the lines already adopted, viz, of elevating the standard of preliminary requirements for the dental student, endeavoring to give more and better instruction in the dental colleges, and using greater discrimination in the granting of the dental degree.

I am in hopes that in this country some day we shall reach that utopian condition when all these requirements and conditions shall be the same in every dental college throughout the Union, when we shall have one license-examination board to which shall be referred the qualifications of every graduate of this or other countries, and when the license to practice in one state will hold good in any other state where the practitioner may desire to locate.

Dr. M. L. Rhein, New York. It has been a very great treat to listen to the *résumé* of the history of dentistry in the different countries, presented to us in such an elaborate yet concise way as it has been.

I tried to be a very careful observer of dental conditions in Germany, Austria, and Hungary, last summer, and I was on that occasion particularly struck by the great evolution that has taken place in those countries, during the interval

of nine years that elapsed since my former visit.

The progress that appears to have been made, as remarked by the essayist, is so stupendous that it was impossible not to be impressed by it, and I was especially impressed by the progress made in the practical side of dentistry, which Dr. Starr seems to imagine is not the case. I am not referring to the magnificent educational facilities that are offered in the scientific part of the work; I am speaking now of the practical side—operative dentistry, prosthetic dentistry, and orthodontia. The equipment, the armamentarium, seemed to be no different from what we see right here in the state of New York. This was very unexpected to me, and probably for that same reason Dr. Starr takes the position he does. I should have felt the same way had my eyes not been opened to this amazing change in conditions, which Dr. Jenkins, as a resident of Germany for so many years, has undoubtedly seen unfolding day by day. The sentiment that Dr. Jenkins expressed here today is one that could not help but strike me forcibly—that is, that the supremacy of American dentistry, while it may not be menaced today, in this year 1910, is in great danger unless great measures are instituted in this country to meet this remarkable evolution, not purely of the scientific, but also the technical side of dentistry.

Dr. Hofheinz in his beautiful remarks spoke with that remarkable sense of fitness of the wonderful change in this country in political matters, and the apparent uplifting of the moral sense of America that is going on from a political standpoint. It is a peculiar trait of our country, up to the present day, that we have always succeeded in meeting every issue; and to my own mind, it appears to me that the troubles that the dental question has met with in this country rest practically on the same basis as our political situation. In other words, we have become fallow; we have advanced less rapidly than these other nations, and less rapidly than we did prior to the last ten or fifteen years. This is practically the same condition as is confronting the politics of this country. But, I believe the American dentists will meet the situation in such a way that we shall be able to keep in the front rank.

The question is, How shall we meet the situation? It is very easy to generalize in this matter, and the picture which Dr. Jenkins has portrayed to us and which I have seen, and which has been pointed out in an editorial in one of the recent numbers of the DENTAL COSMOS, should not make us skeptical of the real state of affairs. It is a difficult matter for a large profession, such as we are, to look an issue of this kind squarely in the face, especially if we are skeptical of its reality. It is always an unpleasant matter to bring to the attention of a body of men the fact that they who have been supreme in their particular calling are in danger of losing supremacy.

A question that has entered into this discussion, and one that seems to be very germane to it, is the relation of medical education to dental. During my visit to Austria especially, in Budapest in Hungary, I took particular pains to investigate this phase of the question. The dental department of the University of Budapest appeared to me to be built on the most perfect lines of education for our specialty, remedying the very deficiency Dr. Starr alluded to as making dental education such a difficult problem in the United States. Dr. Starr spoke truly of the ignorance of the medical man in this country in regard to dental matters; he is frequently more ignorant of certain facts than many intelligent laymen are. This condition does not exist in Hungary, because every medical man, before he is able to obtain his degree in medicine, must take a course, not in dental technics, but in dental principles, and pass an examination in those subjects. A special course is given for that purpose in the dental department of that university. In other words, these people have met the issue.

The great difficulty which they seem to meet with abroad is the enforcing of the laws in regard to the practice of dentistry, because there is a large class of what might be termed mechanical den-

tists, who starting as laboratory workmen have acquired technical skill in dentistry and then persistently violate the dental law. There seems to be greater difficulty in enforcing the law in regard to those men abroad than there is in this country. The combined attributes of technical skill and scientific knowledge make the position of the ethical practitioner abroad a most enviable one. I have never in my life attended a meeting of dentists such as I did in the city of Budapest at the International Medical Congress, where I found that my position as a dentist placed me on a level with every other man in attendance. That is what the medical degree has done for the dentists in Austria and Hungary. I have attended medical meetings, and stomatological sections of such meetings in this country, sections of the American Medical Association and of international medical congresses; but we have always felt the sting, although we were medical men, of the fact that we were nothing but dentists. That feeling was absolutely absent at Budapest, and it came about simply because the educational conditions and traditions in Austria are so different, and the dentist occupies there the position of equality which we are justly entitled to, but are frequently too modest to ask for.

I speak feelingly on this subject, because I believe the only way of reaching the goal that we are after is by realizing that the evolution of education means that our descendants must know as much of the medical science of the human body as any man that practices medicine; and I take exception to what Dr. Starr said, as to what need a dentist has of knowing anything about gynecology and obstetrics. I can see the usefulness for the dentist of these branches of medicine, and I would not make an exception of any. If we are to practice on the mouth, on a basis of equality with the medical profession, we cannot separate one part of the body from the others. The blood that flows around the mucous membrane and the pericemental tissues reaches every part of the body, and it is impossible for any one of us to intelligently treat the mouth successfully unless we understand the body as an entirety, and this we can and must do in the future.

The state of Virginia, when it passed a law this year stating that after 1913 no man can practice dentistry in that state unless he meets those requirements, has stood out in the foreground and shown to the rest of the United States what their duty is in this direction.

At the memorable banquet given in the city of New York last winter to that eminent dentist, Professor Truman—a man who all his life has stood on the basis that Dr. Starr maintained today, and in opposition to what I am saying at this moment—Professor Truman, in one of the most sentimental speeches that I ever heard, spoke to the assembled guests something like this: "You may like it or not—the dentist of the future must be a doctor of medicine." When a man like Professor Truman, who has opposed this movement all his life, finally changes his mind and says we must take the opposite road if we want to fulfil our real destiny in our life-work, I leave it to you whether it is necessary or not for you to weigh carefully, much more carefully than you have in the past, the real educational conditions that confront us in this most serious question of dentistry at the present time.

Dr. Jenkins (closing the discussion). Dr. Hofheinz noticed that I had not mentioned Russia. I refrained from doing so for certain reasons. Personally I have the very greatest regard for many of our distinguished colleagues in Russia. For the Russian people I have a profound admiration. They are a phenomenally gifted people—a people of great brains and great heart. Amongst all the Slavs, they stand pre-eminent as a people who, in spite of the terrible revolutionary excesses which have occurred in that country, have great self-control, and who have given to the world astonishing examples of intellectual vigor and brilliancy of the highest kind.

Dentistry, however, is unfortunately in a very extraordinary condition in Russia, and no one is justified in giving an account of the conditions of that

country unless he knows very much more about it than I do. I can only tell you, as one incident in the cause of dental education in Russia—over 90 per cent. of the dental students are women, and a considerable number of them never expect to practice dentistry, and the same is true of some of the men who take the dental degree; for the possession of a professional degree permits one to live in Russia where one wishes, and any one of you who is familiar with the conditions there, knows what a great privilege that is.

There is also so lamentable a condition among the authorities, particularly the police, that there has been recently revived a sale of bogus diplomas—the seat of that industry being the city of Berlin, and the police seem to be unable to discriminate between the diplomas issued in this surreptitious way and the genuine ones.

The condition is such that one is scarcely able to express an intelligent opinion upon what the future of Russian dentistry will be, or what it is now; but among the men who stand at the head of the profession in Russia there are many most able, admirable, and worthy men—men whom we should all be proud of, and whose society we should all greatly enjoy.

I am very grateful for the kind remarks which have been made by the other gentlemen. I must say to Dr. Starr that I hope I have not given the impression that I was offering advice to the eminent instructors in dentistry in this country. My object is only to present a picture, so far as I can see it, of conditions in Europe which it seems to me must inevitably react upon us, and in offering these views to you for consideration, I leave it to you to decide whether they should affect your action.

I am glad to confirm what Dr. Rhein has said in regard to the technical improvement amongst our colleagues, not only in Austria but particularly in Germany, and also in other European countries. I know of nothing so pathetic as the condition of some medical men who have attempted to practice dentistry without having had a sufficient technical training. The result has been disastrous for their patients and for themselves. As a natural result, in those countries—as for instance in Belgium—where no attempt is made to give such technical instruction, the men seek it themselves with great avidity; and even in such countries they succeed in greatly improving in technique. In Austria and in Germany it has already been accomplished. I could show you patients from the hands of many Austrian and German colleagues, and, if you were not informed that they were treated by Austrians or Germans, you might readily suppose the most eminent technicians in the United States had done the work.

What I have particularly upon my mind, however, is to accentuate not only the present international character of dentistry, but its future. We have to learn from each other, and, as means of communication become more easy and more frequent, there is very much which every nation can learn in every department of industry from another, and this is particularly the case in dentistry. We could not have a finer example of what German dentists are accomplishing in the experimental field than in the paper which Dr. Ferris presented today, a translation of the paper of that distinguished German professor. Whether we like it or not, eventually we are certain to come together as members of one profession. All of those who practice dentistry throughout the world will eventually practice it upon the same general basis of education. I feel that this is absolutely inevitable, and I shall hail and bless the day.

Election of Officers.

The following officers were elected for the ensuing year:

President—A. R. Cooke.
Vice-president—Ellison Hillyer.
Secretary—A. P. Burkhart.
Treasurer—M. D. Jewell.
Corresponding Secretary—H. C. Ferris.

The newly elected president was then installed.

Dr. A. R. Cooke in a few words acknowledged the honor conferred upon him, and expressed his hope for a successful year, and his dependence upon the same hearty support as that accorded to his predecessor, Dr. Nash.

The minutes of the afternoon session were read and approved, after which the society adjourned to meet in the city of Albany, N. Y., the first Thursday in May 1911.

Ellison Hillyer, *Secretary.*

DENTAL FACULTIES ASSOCIATION OF AMERICAN UNIVERSITIES.

Second Annual Meeting, held at Denver, Colo., July 18, 1910.

First Session.

The second annual meeting of the Dental Faculties Association of American Universities was held at the Brown Palace Hotel, Denver, Colo., and was called to order at 10 o'clock Monday morning, July 18, 1910, by the president, Dr. J. G. Sharp, San Francisco, Cal.

The secretary, Dr. Edward C. Kirk, called the roll, and the following representatives, duly authorized by their several universities, responded: Dr. J. G. Sharp, dental department University of California; Dr. Alfred Owre, dental department University of Minnesota; Dr. Richard Summa, dental department University of Iowa; Dr. N. S. Hoff, dental department University of Michigan; Dr. W. E. Boardman, Harvard Dental School; Dr. E. C. Kirk, University of Pennsylvania School of Dentistry.

The Secretary then read the minutes of the last meeting, also the minutes of the meeting of organization.

Dr. Summa offered as a correction to the minutes the fact that the University of Iowa was represented at the Boston meeting of organization.

On motion the minutes were approved with the correction offered by Dr. Summa.

The Secretary asked for the official titles of each of the schools represented, with the following result: Harvard University, Dental School; University of Michigan, College of Dental Surgery; University of California, College of Dentistry; University of Iowa, College of Dentistry; University of Minnesota, College of Dentistry; University of Pennsylvania, School of Dentistry.

Dr. Richard Summa occupied the chair while the president, Dr. J. G. Sharp, read his annual address, as follows:

President's Address.

Members of the Dental Faculties Association of American Universities,—Organized as we are to promote higher standards of education in our profession, it naturally devolves upon a new organization to begin by eliminating the infirmities of the past in educational methods, and retaining and adding to those that are wholesome. In the effort, however, to promote the welfare of our profession along these lines, we must guard against the over-enthusiasm and consequent haste that so often land us in the pitfalls of our progress. We are organized for a noble purpose, and it is quite apparent, after a perusal of the voluminous amount of literature put forth in the past year on the subject which we have to consider, that there is need for such organization. We read much of the medical training for the dentist, and we read somewhat as to the methods pursued in many high-grade

dental schools being all that is required; however, whichever method prevails, as educators and as organized with a hope that our acts will bear fruit because of a sincere interest in our profession and the welfare of mankind, we must advance slowly, yet unfalteringly, apace with the demands made on us by humanity, and without losing sight of the fact that the results of our professional work at present are largely dependent upon our ability as mechanics, which factor will become less and less prominent as science, with resulting preventive measures, takes precedence over it. In the meantime, however, I think the present system will have to suffice, and that if one cares to become a stomatologist in the broadest sense of the word, after finishing a dental course he should further pursue medical studies. I here suggest two steps in dentistry, the mechanical first and the stomatological second.

Being organized for the purpose of offering a guaranteed basis of standardization for dental schools to our profession, by virtue of our members being controlled by the Association of American Universities, I believe we could increase the scope of our usefulness by extending the privilege of membership to such schools and universities as are on the accepted list of the Carnegie Foundation for the Advancement of Teaching, and to me it would seem advisable to so amend our constitution. It would be well at this point to quote from an article of Commissioner of Education Brown on the Carnegie Foundation. He says: "Because of its ability to give or withhold valuable grants, so that these grants will be made only to institutions of a certain academic grade, and because of a provision in the office of the foundation for the investigation of all institutions applying for such grants, this establishment has become one of the most powerful agencies for clearing up and unifying our standards in higher education." It would likewise be well to seek the assistance of this institution in clarifying the dental educational atmosphere, as it is now doing for the medical profession. Such assistance would further tend to secure recognition of our dental schools and their graduates, and remove the stigma of dental board surveillance over them and thus pave the way to interstate and foreign recognition of them.

The next step of importance which I feel should be brought up for consideration by this body is the addition of one year to our curriculum, making it four years. Our students at present are overcrowded, and further it seems desirable to broaden the field of scientific work in our schools; at the same time an effort should be made to produce greater uniformity of our curricula, as regards subjects to be taught and time for teaching them. This factor might be beneficial in establishing a national standard.

Some discussion arose at our last meeting as to the time and place of our meetings. To me it seems advisable that we should meet in conjunction with the National Dental Association. This would tend to enlarge our meetings, and likewise augment our activity in the National Association, in which we should become interested members. This association, through a committee, should interview the Commissioner of Education in reference to the establishment of a professional advisory council in connection with the department of the Interior, to discuss international educational problems with foreign nations through the department of State, instead of as individuals. In so far as our standards suffer by comparison with those of foreign countries, they should be corrected, and *vice versa*. No real national standard can be brought about until such harmony exists. We would thus spread our influence in the cultured nations of the world, and wield a great influence in bringing about the establishment of a federal commission or examining board of proper educational attainments. In all these dental affairs of national and international importance this association should be actively interested.

In reference to membership, if it is the wish of the members to include schools of the Carnegie accepted list, I would call attention to the University of Toronto Dental School, but as our organiza-

tion is purely a national one, some special provision would have to be made to include schools in Canada.

It is worthy of mention that the Pennsylvania Dental College has become allied with the University of Pennsylvania and ceased to exist as a separate school—a commendable effort in promoting a good cause.

To further increase the good results of our work, I believe we should act as far as possible in harmony with other educational factors, rather than appear to antagonize them, where it can be done without in any sense lowering the bars of membership that offer protection to our profession. With this thought in mind it might seem advisable, where schools outside this association are willing to comply with the regulations of this association, that we indorse them for a period of three years, thus encouraging them to a desire to become a department of some university, standardized as are those that are members of this association, which must be done within the three years or such indorsement be canceled.

As the development of professional character in our graduates is one of the objects sought by dental schools of proper standing, I feel that we should lay special stress in the future on the matter of preliminary studies with the object of developing culture, upon which professional character greatly depends. This should be a prerequisite for matriculation into schools of such importance as those of the dental profession.

In conclusion, I wish to thank the members of the association for extending to me the honor of being your first presiding officer, and as I give way to my successor it is with the wish that, with your assistance, he may so guide the affairs of the association as to make our hopes a reasonable certainty, and meet the expectations of the dental profession.

It was moved that the discussion of the President's address be postponed until after the regular routine business had been disposed of.

Motion carried.

The secretary-treasurer, Dr. Edward C. Kirk, then read his report, detailing the material business features of the work of the association for the preceding year.

The next order of business was the report of the Executive Committee.

Dr. Hoff, chairman, reported that the committee had no formal report to make, as nothing had been done by the committee, and that the duties of the committee had not been definitely understood.

Dr. Sharp stated that in calling the meeting he had probably overstepped the bounds of his office, as that was part of the business of the Executive Committee.

Dr. Hoff said he understood that the committee was the *Ad interim* Committee, but that nothing in the nature of business to transact had been presented to the committee.

The next order of business was the report of the Educational Committee, Dr. Eugene H. Smith, chairman. Dr. Smith being absent, Dr. Boardman presented his report, as follows:

Report of the Educational Committee.

As chairman of the Educational Committee of the Dental Faculties Association of American Universities, I herewith suggest the following requirements for admission to the dental schools holding membership in this association:

All candidates for admission holding a degree in letters, science, or medicine, from a recognized college or scientific school, or who have passed an examination for admission to any reputable college of letters, or who present diplomas from a four-years high school covering subjects hereinafter mentioned are to be admitted without an examination. Candidates presenting diplomas from reputable high schools must have passed examination in the following subjects:

English, Physics, Latin or French or German, Chemistry, Algebra, and Geometry.

All other candidates must pass ex-

aminations in the following subjects to the value of sixteen units:

English, four units.
Physics, including the laboratory course, two units.
Latin, four units, or French or German and History, four units.
Chemistry, two units.
Algebra, one unit.
Geometry, one unit.

The foregoing subjects to be required in each case, the remaining units to be made up from the following electives:

Manual Training, one unit.
Solid Geometry, one unit.
Botany, one unit.
Zoölogy, one unit.
Anatomy, Physiology, and Hygiene, one unit.
Woodworking, one unit.
Blacksmithing, one unit.
Chipping, Filing, and Fitting, one unit.
Machine-tool Work, one unit.

I would further suggest that our committee recommend that the schools holding membership in the Dental Faculties Association of American Universities shall not accept the work done in other dental schools outside of the association, nor admit the students from these schools to advanced standing, unless the schools have a course of nine months, in which case we will allow the time only. Each student must present a certificate of having had the preliminary training equal to the requirements of the schools of our association, and be required to pass all of the examinations in the regular course.

In regard to the number of conditions allowed for matriculation, I would suggest that two units be the maximum number on which to admit a student.

In regard to the standing of foreign dental schools, I have had time only to investigate the status of the Russian schools, and find as follows:

That all of the universities in Russia are governed by the ministry of Public Instruction and its agents; that the medical faculties of the Russian universities have no course in dentistry, but that dentistry is taught in special dental schools. After finishing the course at the dental schools, the students are obliged to pass an examination at one of the four universities in Russia—that is, St. Petersburg, St. Vladimir, Kazan, and Kharkow.

The maximum preliminary training for a student in dentistry in Russia is the equivalent of two years in an American high school; that is, six classes in a Russian gymnasium. Eight classes are required for a student in medicine. The maximum length of time required to obtain a certificate from a dental school is two and one-half years, or five semesters of four months each.

I would suggest that our committee recommends that the schools holding membership in the Dental Faculties Association of American Universities require a candidate for admission who has been trained in Russia to present a certificate of eight classes of a Russian gymnasium, or make up the equivalent of two years in our American high schools, that he be allowed but one year's time, and be required to pass all of the examinations of our three years before becoming a candidate for our degree.

Respectfully submitted,
Eugene H. Smith, *Chairman.*

On motion, the report of the Educational Committee was received and placed on the minutes.

The President's address was then taken up for discussion. The first point of the address, that of the standard of admission to the association based on the accepted list of the Carnegie Foundation for the Advancement of Teaching, was discussed at length by Drs. Hoff, Kirk, Sharp, and Owre, after which Dr. Kirk presented the following resolution:

Whereas, The Carnegie Foundation for the Advancement of Teaching has done more than any other organization in determining and maintaining a proper standard of entrance requirement for admission to colleges and universities; and

Whereas, The investigation that has been and is being conducted in medical educational institutions, with regard to admission requirements and facilities for giving instruction, has done much to elevate the standards of medical education; therefore be it

RESOLVED, That schools or colleges of dentistry that are an integral part of and under the direct supervision of universities accepted by the Carnegie Foundation for the Advancement of Teaching may be eligible to hold membership in the Dental Faculties Association of American Universities.

Dr. Owre seconded the resolution with the understanding that the amendment to the by-laws made necessary by this resolution lie over for final action until the next annual meeting.

The resolution was adopted.

Dr. Kirk presented the amendment to the by-laws, as follows:

To amend article III, section 1, of the Constitution and By-laws:

After the word "Universities," *insert the words* "or accepted by the Carnegie Foundation for the Advancement of Teaching."

The time and place of the next meeting was then discussed, and Dr. Hoff invited the association to meet at Ann Arbor, Mich., directly after Christmas of this year. Motion was made and carried that the invitation be accepted, and that the date of the meeting be agreed upon later by the Executive Committee.

With reference to the suggestion of an advisory council for the purpose of harmonizing the educational standards of America and of foreign countries, Dr. Hoff moved that this question be left in the hands of a committee consisting of Drs. Kirk and Smith, with Dr. Sharp *ex officio*. The motion was duly seconded and carried.

The suggestion in the President's address with reference to a four-year curriculum was discussed, and Dr. Owre presented the following resolution:

RESOLVED, That the Educational Committee be instructed to take up for consideration the question of the addition of a fourth year to the dental curriculum, as suggested in the address of the president, and submit a report thereon at the next general meeting of the association.

The motion was duly seconded and carried.

It was moved that the President's address be accepted and placed on file, with the thanks of the association for its very admirable character. Motion carried.

The report of the Secretary-treasurer was called up for action, and Dr. Owre moved that the report be accepted, and that the thanks of the association be extended to the Secretary-treasurer for the very efficient service rendered. Motion carried.

Dr. Kirk, in speaking of the activities of the association, thought it desirable that the association should get into closer touch with the Fédération Dentaire Internationale, as the federation had for its aim the harmonizing of educational standards of the world, and also the raising of the educational standards for dentistry.

Dr. Owre moved that the association apply for membership as a body in the International Dental Federation. Motion carried.

The Secretary asked for suggestions with regard to making public the activities of the association, and Dr. Owre moved that that be left to the discretion of the secretary-treasurer. Motion carried.

Dr. Kirk spoke of the Pennsylvania College of Dental Surgery surrendering their charter because of their inability to continue as an educational institution under the present conditions without lowering their educational requirements.

Dr. Owre moved that Drs. Kirk and Hoff be appointed a committee to draw up resolutions regarding the discontinuing of the Pennsylvania College of Dental Surgery, and that the resolutions be spread on the minutes of the association and copies of the resolution be sent to the faculty of the Pennsylvania College. Motion carried.

Motion was then made and carried to adjourn until 2 P.M.

Second Session.

The association was called to order at 2 P.M., by the president, Dr. Sharp.

The report of the Educational Committee was brought up for discussion.

Dr. Kirk and Dr. Sharp discussed the question of the prescribed preliminary educational requirements suggested by the Educational Committee for entrance into the schools of the association, and Dr. Kirk moved that this portion of the report be referred back to the committee for further elaboration, with the suggestion that the committee obtain from each of the institutions the different educational requirements, the preparatory work required, the value of the counts from each institution, etc., and that the committee at the next meeting bring in recommendations of a plan by which the unification of these several standards of value may be materialized.

The motion was duly seconded and carried.

The next portion of the report taken up for discussion was the number of conditions that the matriculant may carry on entering a school.

After some discussion, Dr. Kirk moved that this question also be referred back to the committee and included in the original motion. Motion carried.

The next portion of the report considered was the recommendation with regard to the acceptance of Russian students, and it was moved that that portion of the report be adopted. Motion carried.

Dr. Summa then moved that the report of the Educational Committee be accepted as a whole.

The motion was seconded by Dr. Boardman, and duly carried.

Dr. Sharp presented a number of reports on foreign dental schools, and Dr. Summa moved that they be referred to the Committee on Education for the information of said committee. Motion carried.

OFFICERS AND COMMITTEES.

The next order of business was the election of officers for the ensuing year, which resulted as follows:

President—Dr. J. G. Sharp.
Vice-president—Dr. Eugene H. Smith.
Secretary-treasurer—Dr. Edward C. Kirk.
Educational Committee—Dr. Edward C. Kirk (one year). Dr. Alfred Owre (two years). Dr. Eugene H. Smith (three years). Dr. J. G. Sharp, *ex officio*.
Executive Committee—Dr. J. G. Sharp, *ex officio*. Dr. Richard Summa (one year). Dr. N. S. Hoff (two years).
Advisory Council—Dr. J. G. Sharp, *ex officio*. Dr. Edward C. Kirk. Dr. Eugene H. Smith.

At the suggestion of the President, the association then listened to a presentation of the question of Dental Legislation in California, presented by Dr. Millberry, but no official action was taken in regard to this question.

The President then declared the association adjourned until the meeting in Ann Arbor.

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PHILADELPHIA, DECEMBER 1910

EDITORIAL DEPARTMENT.

THE SWING OF THE PENDULUM.

SINCE Merrit of Pittsburg advocated percussive force by means of the hand mallet for condensing gold in the filling of cavities in teeth, an almost endless variety of modifications of the process has been suggested. Hand mallets varying in weight, texture, and composition have been multiplied *ad infinitum*, each because of some real or assumed advantage having its advocates. To avoid the need for an assistant by giving to the operator physical control of the percussive force and the use of the disengaged hand, various automatic mallets operated upon the spring principle were devised and found their way into general favor, the most popular being the Snow and Lewis, the Abbott, and the Foote automatic mallets. Following the automatic type of mallet came the Bonwill electro-magnetic mallet (in 1875), of which various modifications appeared, each involving the same principle; after which the engine mechanical mallet of Bonwill was introduced (in 1879), the efficiency of which depended upon the propulsive impact of a

projecting lug in the periphery of a wheel rapidly driven against the head of the instrument shank.

The engine mallet of Bonwill involved a principle quite different to that embodied in any preceding condensing instrument, and its efficiency was as distinct an improvement as its working principle was novel. The blow delivered to the gold depended for its quality as well as its force upon the speed of revolution of the lug wheel, which in direct relation to the speed of revolution might be anything from a simple push to a direct live blow. No gold-packing mallet previously devised embodied the same flexibility of resource in its range of percussive force as the Bonwill engine mallet, nor is it possible to produce with the hand mallet or any other mallet the same quality of blow. In making this statement we refer to the engine mallet as originally designed by Bonwill and used as he taught its use.

Our attention has been directed to this matter through the interesting report of the "Concerted Gold Filling Clinic" before the Illinois State Dental Society by Dr. Charles Southwell.* The clinic was essentially a test of the relative efficiency of the engine mallet and of the hand and automatic mallets as gold-packing instruments—a test which, though not altogether convincing, proved by no means discreditable to the engine mallet. What has come to light very definitely, however, is the fact that in the course of a short generation the pendulum of professional favor has swung back to the hand mallet and the automatic, and away from the electric and engine mechanical mallets. It is most striking and surprising—at least to those who have been trained in the use of the Bonwill mallet—that at this late day it could be considered necessary to determine by competitive test the superiority or otherwise of the mechanical mallet as a condensing instrument. Notwithstanding the extreme care which may be exercised in securing equality of conditions and of accuracy in recording results, the competitive test can at its best furnish data which are in the nature of presumptive evidence only. The real test of a filling is the test of time and service in the mouth, and when the fillings still in service made by Bonwill and by Webb are placed in evidence there can be no further

* *Dental Review*, November 1910, page 1124.

question as to the efficiency of both the electric and the engine mallet for packing gold. As a time- and labor-saving device the engine mallet is as far in advance of the hand mallet as the engine bur is in advance of the hand excavator, and the contention that the hand mallet gives greater latitude or delicacy of blow in working against frail walls or over margins is the evidence of lack of familiarity with the possibilities of the engine mallet or a mistaken sentimentality with respect to the hand mallet. That there has always existed a widespread lack of understanding of the range of usefulness and adaptability of the engine mallet is evident from the number of so-called improvements that have been suggested by well-meaning but mistaken individuals who had never clearly grasped the foundation principles taught by Bonwill as essential to the successful use of his mallet. As a result, the original Bonwill mallet was "improved" pretty much out of semblance to the original model, and practically killed in the house of its friends.

The writer had the good fortune to receive his training in the use of the engine mallet directly from the inventor. It emancipated him from the drudgery of packing gold and made the operation a pleasure. He is therefore much interested in the effort being made by Dr. Southwell to propagate correct views about and a larger interest in that instrument. That the engine mallet is still in daily use by many operators who came personally under the instruction of Dr. Bonwill in its use is certain, and as a matter of more than passing professional interest we shall be glad to learn how many operators still use the engine mallet in accordance with the Bonwill method.

We believe that the question of the mallet as a condensing instrument is still a live question, notwithstanding the use of plastics and the advent of the inlay, for despite these innovations we have not heard of any operator disposing of his gold pluggers; and even at the risk of a charge of being antiquated, we are further of the opinion that the power mallet of Bonwill is a time-saving, a soul-saving, and a tooth-saving improvement upon the hand mallet. The pendulum can never swing beyond the sphere of influence of the gold filling until that utopian realization the "ideal filling material" has been attained. It is of importance, then, that the problem of determining the best means

for condensing gold should be solved in some such manner as that which has been proposed by Dr. Southwell, and that more attention be given to the subject of gold filling technique by the profession in general, lest the ability to do high-grade operations of that character become a lost art.

Review of Current Dental Literature.

[*Zahnaerztliche Rundschau*, Berlin, July 10, 1910.]

THE TREATMENT OF WOUNDS AFTER EXTRACTIONS. By Professor Brandt, Berlin.

Altogether too many dentists still adhere to the old method of having their patients rinse their mouths with water after extractions. The dangers involved in this antiquated procedure are obvious, for not only is the water unsterile, but during the rinsing a great number of micro-organisms that are always present in the oral cavity are washed into the open wound. The treatment of these wounds should be carried out after strictly surgical and pathological principles, the treatment to be aseptic and styptic in case of a pure wound, antiseptic and draining in case of an infected wound. If there is any doubt as to the condition of a wound, it should be treated as an infected one. In small wounds from extraction compressing with a sterile wad of cotton and the application of an aseptic tampon suffices. If the wound continues to bleed, a few drops of an adrenalin solution are applied to the tampon. In larger and profusely bleeding wounds tamponing with sterile gauze or iodoform gauze is indicated. If several approximating teeth have been extracted, it is wise to remove the alveolar septa with the bone-forceps, as the healing process is thereby hastened. In profuse bleeding it is generally sufficient, after tamponing the wound itself with iodoform gauze, to have the patient hold a broad tampon over the dressed wound by biting on it for about half an hour. The gauze is removed from the wound piece by piece as it is being pushed out gradually by the granulations in the fundus of the wound. The gauze is removed at once only if putrefaction or secondary hemorrhage is not to be expected. In suppurating wounds the gauze tampon is introduced only loosely, so as to act as a drain. It is to be hoped that this scientific treatment of wounds from extractions will soon entirely replace the antiquated rinsing method.

[*Deutsche Monatsschrift fuer Zahnheilkunde*, Berlin, September 1910.]

VIBRATORY MASSAGE IN DENTISTRY. By Dr. J. Kieffer, Strassburg.

Vibratory massage, which now occupies a prominent position in general medicine, is very favorably indicated in anemics suffering with recurrent stomatitis, in the post-operative treatment of fistulas and pericemental disease, in premature atrophy of the alveoli, and in pyorrhea alveolaris. Persistent pericementitis will yield to this treatment, and the nutritive condition of the oral tissues in anemics and diabetics is considerably improved. The process of repair of the gingival tissues after extractions, also the healing of wounds after extensive resections, is also favorably influenced. It is also possible by a systematic application of vibratory massage to stimulate the growth of the maxillary bones in children, and thus to limit the necessity for regulation. The author has designed a vibratory instrument which in very simple fashion can be attached to the dental engine by a slip-joint. A small eccentric is set in vibration by the revolution of the engine crank, imparting a vibratory motion to the metal ball in which the simple apparatus terminates. By modifying the speed of the

engine or the weight of the eccentric by filing or adding some solder, the intensity of the vibration can be regulated. Treatment is administered at intervals of from two to three days. In sensitive patients, instead of the metal balls rubber balls may be used, which, however, are not as easy to sterilize. By applying a layer of cotton on sensitive areas or wrapping cotton around the metal ball the intensity of the vibratory motion can also be reduced. Vibratory massage is of course not to be regarded as a panacea, but deserves serious consideration as a most valuable accessory to dental therapeutics.

[*Lancet-Clinic*, Cincinnati, July 23, 1910.]

SYPHILITIC AND CANCEROUS MANIFESTATIONS OF THE ORAL CAVITY. By Dr. C. J. Broeman, Cincinnati.

There are probably no two diseases at the present time that are of more importance to the medical and dental professions than syphilis and carcinoma. When we stop to consider that it is estimated that from five to eighteen per cent. of the population are syphilitics, with one in every ten of the inhabitants of Paris and Berlin (the only cosmopolitan cities of which reliable statistics are obtained), and that one out of every eight women and one out of every eleven men past the age of thirty-five years die of carcinoma, the colossal importance of these two diseases can to some extent be realized. Syphilis and cancer, although alike in some respects, are vastly different in others. They both are diseases that are found in every walk of life, affecting both sexes, the old as well as the young, and both conditions involving at times every tissue and organ of the human body.

Cancer of the oral cavity occurs more frequently in men than in women, only fifteen per cent. in the tongue being found in women, and probably a smaller percentage in the case of cancer of the lip. In about eight per cent. of all cancer cases the disease is located in the tongue, while eleven per cent. of all deaths from cancer are due to cancer of the mouth and lip. Between thirty and forty years of age is the time when cancer is most likely to be found, although it may occur at any age, a case of carcinoma of the tongue being reported in a boy of eleven years.

Chronic irritation is a very important cause of cancer, and in many cases we obtain such a history, especially in cancer of the lip and tongue. The chronic irritation may be in the form of a jagged or rough tooth that irritates the tongue in its every move, or it may be due to an ill-fitting dental plate. Continual smoking or the rubbing of the short stem of a pipe upon the lip or tongue is another cause of irritation. Here the hot pipe stem is believed to be the cause rather than the stream of hot smoke. That smoking does play an important factor in the production of cancer of the tongue and lip is shown by the fact that it is more common in men than women and is more often found in habitual smokers and in those who have suffered from chronic smokers' inflammation of the tongue. Raw spirits, continual and incessant chewing, and the frequent partaking of hot drinks may also be the cause. It is claimed that 50 per cent. of cancers of the tongue have been preceded by leukoplakia or by white patches of the tongue.

The symptoms of syphilis are divided into three arbitrary stages, the primary stage consisting of the initial lesion and the local and general adenitis; the secondary stage consisting of the skin manifestations, the roseola, which is a general erythematous skin eruption, the various lesions of the mucous membrane, associated with constitutional symptoms of malaise, headache, slight fever, sore throat, loss of appetite, more or less anemia, and at times a partial or total loss of hair; the tertiary stage, which is non-infectious, being characterized by the formation of gummata and necrotic ulcerations, which attack every organ of the body. Symptoms of any of these stages are at times present in the oral cavity. Thus we have the primary lesion of the lip, tongue, gum, or tonsils. In men we find the extra-genital chancre to be present in about four per cent. of all cases of syphilis, and two per cent. are extra-genital in women. For one to become inoculated with the syphilitic virus it is necessary that there be an abrasion of the skin or mucous membrane, either macroscopic or microscopic. The inoculation is due to either direct or indirect contact with an infectious syphilitic lesion. The direct infection may result from kissing or from being bitten by one suffering with infective lesions of the mouth. The indirect ways of infection are various, being the result of contact with some intermediate

object, as the public drinking-cup, eating-utensils, spoons, glasses and knives, cigarette and cigar holders, penholders, pencils, toothbrushes, etc. Another way in which at times an innocent person becomes infected with syphilis is through the physician's or dentist's instruments.

The author then proceeds to describe in detail the various symptoms characteristic of the three stages of syphilis as noted in the mouth, the influence of hereditary syphilis on the formation of the maxillary bones and the teeth, and the symptoms of carcinoma in the mouth, and gives valuable suggestions for the differential diagnosis between syphilis, cancer, and tuberculous ulceration of the oral cavity. The therapeutic, surgical, and prophylactic measures in the treatment of these diseases are briefly indicated.

In concluding, the author calls attention to the necessity of examining the entire mouth and pharynx in every patient who comes for dental treatment, as many of these diseases, that otherwise would pursue their course toward destruction will thus be recognized, and advice be given as to early treatment. If the dentist learns to recognize the various syphilitic lesions of the mouth, he will be surprised to find how frequently they are present, especially in his patients of the better class, who are often ignorant of their condition themselves. The great importance of this diagnosis for the future welfare of the patient need not be emphasized. Many sequelæ, as the nervous, mental, osseous, and other constitutional disturbances, would be eradicated by the introduction of proper treatment. The dentist, realizing the frequency of syphilis in the mouth, must be careful to thoroughly sterilize his instruments at all times. The public is beginning to know and appreciate the value of sterilization, and the more intelligent class demands this protection. Since chronic irritation plays such as important rôle in the production of carcinoma in the mouth, every dentist should make it routine practice to examine the teeth of all individuals in the cancerous years of life, beginning at about the thirty-fifth year. The roughened edges of teeth, decayed stumps, and ill-fitting plates should be removed or properly attended to, so as to exclude any possible irritation of the mucous membrane. If such a practice is made universal, some cases of carcinoma of the mouth will be avoided, because the etiological factor, *i.e.* chronic irritation, will be removed.

[*La Stomatologia*, Milan, July 1910.]

CHARACTERISTIC REACTION OF THE SALIVA IN DENTAL ARTHRITIS. By Dr. L. Arnone.

For several years the author has been trying to find a chemical reaction which would disclose the presence of uric acid in the saliva. Lactic acid is demonstrated in a test tube containing a two per cent. aqueous solution of carbolic acid with a drop of perchlorid of iron, which gives a light lilac color. If the saliva mixed with this solution contains lactic acid, the surface of the contents of the tube becomes golden yellow, this color being unstable. If it contains pus, filaments are deposited at the bottom of the tube, leaving the liquid perfectly clear. The saliva in this case does not undergo decomposition, and the sediment in time becomes dark. The same reaction can be produced by a drop of commercial lactic acid.

The microscopic observation of the saliva for uric acid is too uncertain, as it contains a very rich bacterial flora, and even if one succeeds in recognizing uric acid crystals, their great variety of shape does not permit of an exact test.

In his search for an unmistakable reaction, Arnone has made the following interesting observation: The saliva of individuals affected with dental arthritis, if put in a test tube containing three drops of perchlorid of iron in 10 grams of distilled or filtered water, is precipitated in a mass, forming a sort of membrane and remaining suspended as a gelatinous substance on the surface, resembling the membrane of an echinococcus cyst. It arranges itself in the tube as a strain, extending to the bottom of the tube. The liquid penetrates this ribbon only very slowly, the membranous form being sustained for several days, not until after a week beginning to break up, remaining visible for a month or more. This characteristic reaction, which is found in arthritis and also in uricemia and hereditary arthritis, very much resembles the reaction of mucin taken from the bile, this latter reaction being obtained with acetic acid or perchlorid of iron.

It is thus shown that patients with dental arthritis secrete an enormous quantity of

mucin, while normally the reaction of mucin is very slight or almost *nil*. An important relationship between an over-production of mucin and uric acid is thus demonstrated. The reaction of the mucin is very rapid if the saliva is taken fresh from the mouth, there being hardly any reaction six hours after taking the saliva from the mouth in summer, and twenty-four hours in winter. The saliva varies in different mouths and according to whether the stomach is empty or not, a repetition of the experiment with saliva from the same individual being recommendable. This reaction is very delicate in the saliva of persons affected with gouty pericementitis, even if no other appreciable symptoms can be noted in the mouth.

[*Journal of the American Medical Association*, Chicago, August 13, 1910.]

THE RELATION OF MODERN DENTISTRY TO THE TUBERCULOSIS PROBLEM. By Dr. S. A. Knopf, New York.

Dental hygiene, the greatest achievement of modern dental science, means prevention and preservation, and these bear the closest relation to the prevention of tuberculosis. One of the earliest and also a very frequent symptom of tuberculosis is an impaired digestion. Therefore, while bad teeth do not constitute the only cause of these digestive disturbances, if they are present they contribute to these pathologic conditions. Ulcerated teeth may give entrance into the bone to tubercle bacilli accidentally inhaled, or as the result of secondary infection. The author emphasizes the need of good sound teeth in the prevention of tuberculosis on the one hand, and in the treatment of it on the other. He then discusses the measures taken by the New York Health Department for dental child hygiene.

The modern treatment of tuberculosis consists in the judicious use of fresh air, plenty of good food, plenty of pure water inside and outside, careful regulation of rest and work, and medical supervision. The proper feeding of the patient is one of the most essential factors, but it cannot be accomplished unless the patient has good teeth. It is very easy for physicians to advise their tuberculous patients to have their teeth attended to, but very few obey the instruction. In the greater City of New York alone, there are from 40,000 to 50,000 consumptive poor, the majority of whom need dental attention. Some of the largest tuberculosis sanatoriums and hospitals of that city are without a dentist, and all the dental work is performed by the medical internes, and consists in extracting painful teeth. Hundreds of these consumptive poor should have an entirely new set of teeth, because they have but a very few teeth left, most of which are bad, and it is impossible for them to heed the physician's advice to eat plenty and chew well. The only means of overcoming this handicap in the most essential part of tuberculosis treatment consists in the establishment of more dental dispensaries. Every sanatorium or special hospital for consumptives should have one or several dentists attached to its staff, according to the number of its patients, with a special well-equipped office and an abundance of the material needed for the efficacious treatment of all patients whose teeth need attention.

[*Zahnaerztliche Rundschau*, Berlin, July 31, 1910.]

THE PROBLEM OF MOUTH-WASHES. By Dr. O. Torger, Dresden.

The author recollects some of the fads for mouth-washes which in consequence of clever and very expensive advertisements have invaded the people, and have produced at least this much good, that the public was awakened to a realization of the importance of sound teeth. In view of the manufacturers' claims, it is the dentist's duty to point out to his patients that such mouth-washes are never a remedy which can protect the teeth against caries, still less restore a carious tooth to health. In our daily toilet we never think of disinfecting our skin while bathing, but leave the combating of the microbes to the defensive forces of our system. It has been proved that those bacteria in the mouth which produce the most serious disorders, such as anthrax, tuberculosis, diphtheria, etc., offer the greatest resistance to disinfectants, while the benign bacteria which combat the former ones are more easily retarded in their development or even destroyed by such agents. By using strongly disinfectant mouth-washes, therefore, we destroy chiefly the benign bacteria, leaving the more dangerous bacteria to undisturbedly develop their specific action.

The best mouth-wash undoubtedly is a healthy pure saliva. No means should therefore ever be applied that retard or dilute its flow. The application after meals of disinfectant mouth-washes retards the normally increased flow of saliva, and frequently produces gastric troubles. An effective hygiene of the mouth can, however, be maintained by the simple use of the brush and tepid water to which some refreshing and harmless flavoring, such as oil of peppermint, alcohol, or table salt, may be added. The author holds the excessive use of the brush in combination with sharp powders and strong disinfectants directly responsible for the premature destruction of the hard tooth structures in many cases.

[*Journal of the American Medical Association*, Chicago, August 6, 1910.]

THE TEETH AND ALVEOLAR PROCESSES AS POINTS OF ENTRANCE FOR THE TUBERCLE BACILLUS. By Dr. F. B. Moorehead, Chicago.

The mouth is probably the most serious factor in the matter of infection from the tubercle bacillus. The tonsil as a gateway of invasion is fully appreciated; it has been carefully studied and discussed. While many statements have been made concerning the mouth in its relation to the tubercle bacillus, not much has been done in the way of scientific study. This statement is a more or less severe indictment of the mouth specialists.

In a rather comprehensive study Odenthal found that 70 per cent. of all children were affected with enlarged lymphatic glands. It is a well-known fact that the lymph glands in children are more easily irritated and involved than in adults. This is particularly true of tuberculosis of the cervical lymph glands. The reason is obvious—the root-canals render the invasion of the tubercle bacillus more likely and easy in children than in adults. The author then, by briefly reviewing the anatomy of the cervical lymphatic glands and their relationship to the roots of the teeth and alveolar process, describes the brief and direct route which leads from the mouth through the tissues of the neck to the thorax. The route of infection by way of the esophagus and trachea is guarded under normal conditions by healthy epithelium. The organism of infection, however, if it gains entrance through the lymphatics, finds a much more fertile field, with a limited defense.

A great many cases are then cited as reported by eminent investigators tracing tuberculosis to the infection of the cervical lymph glands by way of carious teeth, the author citing ten cases of his own observation. Great difficulties are involved in studying the tubercle bacillus, but nevertheless there is an abundance of clinical material for study and observation. While the amount of work done in this special field is limited, proof is at hand that the tubercle bacillus does gain entrance to the body through diseased teeth and alveolar processes, and that the cervical lymphatics are directly infected by this route.

[*La Province Dentaire*, Lyons, October 1910.]

CONTRIBUTION TO THE PATHOGENIC STUDY OF DISCOLORATION OF THE TEETH. By Dr. A. Pont.

Leaving aside discolorations caused by tobacco, tartar, etc., discoloration and pigmentation in the author's opinion is due to three causes: First, alteration in color in consequence of destruction of the pulp; second, alteration in color in consequence of extravasation of the coloring matter of the blood in the dentinal tubules, and third, alteration in color under the action of metallic salts from medicines or fillings.

In cases of destruction of the pulp, seeing that while there is no longer any supply of hematin to the dentin, the tooth nevertheless changes in color without apparent cause and becomes brownish, the author offers the following theory: The albuminous substances contained in the dentin are decomposed, and produce tyrosin. The tyrosin oxidizes in the presence of the oxydases and successively assumes a yellow, amber, and brown shade.

This theory, which is a dental adoption of the explanation of black cataract of the eye as given by Dr. Louis Dor, would explain the cases in which the classic theory of extravasation of blood in the dentinal tubules is unsatisfactory or untenable. Dr. Pont promises further investigations into his theory, and suggestions as to new methods of treatment of discoloration of the teeth.

[*American Journal of Surgery*, New York, July–October 1910.]

LOCAL ANESTHESIA (QUININ). By Dr. A. E. Hertzler, Kansas City.

Dr. Hertzler, in a series of carefully compiled articles, gives a valuable review of the many various methods used in local anesthesia, of which the quinin method is possibly the least known. The London *Lancet* comments on this method as described by Dr. Hertzler, as follows: "The value of quinin as a local anesthetic has hardly as yet been fully recognized in this country, but in America it is used extensively. Any salt of quinin appears to be useful, while the efficacy of the drug seems to be enhanced by its association with the hydrochlorid of urea, and some manufacturers make a salt which is said to be double hydrochlorid of quinin and urea. When a soluble salt of quinin is injected into the tissues, a coagulable exudation forms, beginning a few minutes after the injection and becoming complete after twenty-four or forty-eight hours. The skin is thickened and has a reddish color, but it is not tender, so that the change is hardly inflammatory. The exudation is not organized into fibrous tissue, but is absorbed after a week or two. It is important, therefore, to bear in mind the fact that the skin will become reddened after injection, and that this is no evidence of inflammation. If the skin is injected and at once incised, much of the quinin solution at once escapes into the wound and very little exudation occurs, and the anesthesia is of short duration, though even then it may last a few hours. In these circumstances the wound heals as if no local anesthetic had been used; therefore this is the method to be adopted when a short duration of anesthesia will suffice and prompt healing of the wound is desired. For the mucous membrane a ten per cent. solution may be applied upon pledgets of cotton wool. If the quinin is used for injection, solutions of from one-half to one per cent. should be employed. It may be used either for infiltration or for 'nerve blocking.' After the injection the operation may begin at once if only temporary anesthesia is needed, or after half an hour or more if a more prolonged anesthesia is desired."

[*Revista Dental*, Havana, Cuba, October 1910.]

LOCAL AND GENERAL TREATMENT IN SERIOUS CASES OF PERICEMENTITIS, ACCOMPANIED BY SUPPURATION (PYORRHEA ALVEOLARIS). By Dr. O. Amoedo.

Microbic invasion is most likely to occur in the mouth during a state of reduced power of resistance due to a depression of the system from mental worry, excessive fatigue, menstruation in women, and, above all, to intestinal intoxication. Besides the well-known local measures, therefore, treatment must be directed toward combating the toxins present and preventing the formation of new ones. In order to avoid the formation of new enterotoxins, suitable diet, bacterio-therapy, intestinal disinfection by means of antiseptic purges, and intestinal lavages to produce evacuation of the microbes and their toxins, are to be resorted to.

The general treatment of inflammations of dental origin (pyorrhea) may be summed up as follows: Local disinfection by means of root-canal treatment, or, if necessary, extraction of the tooth; disinfection of the digestive tract by means of lavage, antiseptic purges (calomel) and lactic ferments; destruction of the toxins by serum treatment or by physiologic serum; malt and grape cure, as suggested by Doyen; local treatment by cold, if it is desired to abort the inflammation, by heat if it is desired to bring about final suppuration.

PERISCOPE.

Consequence of Reckless Extraction of First Molars.—Some of the disastrous consequences of ill-advised extraction of first molars are these: A tipping of the second molar, abnormal stress of occlusion on the distal cusps of the second molars, causing a pressure which forces the mandible backward, a lack of growth in the mandible, a dropping back of the other teeth, and excessive overbite.—W. F. JOHNSTON, *Dental Digest.*

A Brush for Collecting Mercury.—A simple method of collecting spilled mercury consists in the use of a brush of No. 40 copper wire, which is amalgamated with mercury. Using the brush as though painting with it, large globules of mercury may be picked up, and on inserting it into cracks even the smallest particles may be collected, so that none need be lost. When the brush is full the mercury is shaken off into a cup.—G. WINCHESTER, *Nature* per *British Dental Journal.*

Flies in Dental Offices.—The London *Lancet* says that the best and simplest fly-killer is a weak solution of formaldehyd in water (two teaspoonfuls to the pint). This is placed in plates or saucers throughout the house. Ten cents worth of formaldehyd will last an ordinary family all summer. It has no offensive smell, is fatal to disease organisms, and is practically non-poisonous except to insects. As the fly has been demonstrated to be a carrier of dangerous micro-organisms of infection, it should be eradicated from all dental offices.—*Western Dental Journal.*

Action of Hydrogen Sulfid Gas on Corrosive Sublimate.—Corrosive sublimate will unite with many of the putrefactive gases, notably hydrogen sulfid, but as it requires the presence of moisture to be efficient and is comparatively sparingly soluble in water, it is difficult to introduce a large enough quantity of this agent to exercise the required amount of effect. Especially is this evident when we remember that in combining with the hydrogen sulfid its antiseptic powers are to a large degree lost.—H. C. WOOD, *Dental Brief.*

Removal of the Rubber Dam After Filling Operations.—After removing the dam, always be careful to see that all of the rubber has been removed from between the teeth, as the leaving of a small piece between the teeth or under the gum will cause a great deal of discomfort, and may even endanger the life of the tooth by setting up a violent inflammation. Remove all of the rubber, massage the gums around the teeth that have contained ligatures, wash out the mouth with a warm solution of some agreeable essential oil, such as cassia, and dismiss the patient.—J. V. CONZETT, *Dental Digest.*

Investing the Wax Model in Casting.—An important step is the placing of the wax model at the proper distance from the end of the ring. If we always set the wax model at a definite distance from the end of the ring, we can soon tell just what pressure is necessary to force the gold to place. The larger the inlay the greater the pressure required. As a guide which will enable the operator to do this, a piece of sheet brass is cut long enough to extend across the end of the ring, in the center of which a projection extends down one-quarter of an inch. A screw is arranged in the bottom of the sprue-holder, or the wire is held in position with wax, and the model raised until it just touches the tip of this projection.—A. E. PECK, *Dental Review.*

Importance of Smooth Surfaces on Approximal Fillings.—Inlays, especially porcelain inlays, are great offenders in respect to the cervical edge wherever inserted. The unpolished surface of an interstitial filling readily retains both germs and food débris, and so will produce caries in an abutment tooth. Cement fillings are bad in this respect, since the fluids of the mouth soon destroy any polish they may have been given to start with. Gutta-percha is perhaps the worst permanent filling we can use at any cervical margin. It swells and its surface becomes corroded and spongy, with the inevitable result of gum infection and recurrent caries at the margins of the tooth.—J. G. TURNER, *Dental Record.*

Method of Making a Porcelain Crown Fit Perfectly.—After the root is prepared and a crown is selected, an iridio-platinum pin is cut to proper length. Inlay wax is attached to the pin, and the crown forced to place on the root with the wax between the root and the crown. All excess wax is carefully trimmed off, wax and pin are removed together and invested, and gold is cast to the pin. The crown is cemented to the pin, and after the cement is hard, the gold is trimmed and polished, when it is ready to be set.—F. B. Johnson, *Dental Summary.*

Individual Inlays versus Abutment Inlays.—The field of inlay abutments made possible by the casting process is extending rapidly, and there seem to be no limitations in the minds of many. An idea that is much too prevalent is that the same cavity preparation and dependence as for anchorage of individual inlays will suffice for inlay abutments. The terrific leverage and torsion that would tend to dislodge an inlay when attached to a bridge is not taken into account; and while the casting process is serving a wonderfully good purpose in this direction, if we fail to observe the mechanical principles involved in its application, we are going to meet with disappointment.—F. E. Roach, *Dental Review.*

Solvents for Rubber and Celluloid.—Benzol or benzine has been used as a solvent for celluloid; other solvents are strong alcohol, ether, acetone, and amyl acetate. For rubber, carbon disulfid, chloroform, benzol, and carbon tetrachlorid are used. An effective solvent for rubber, recently introduced, is ethylene dichlorid; it gives a true solution and not a mere swelling and diffusion of the material, while it has the further advantage of being non-inflammable. Its solvent action is greater than that of chloroform or of carbon tetrachlorid, and as it boils at 55° C., it is more volatile than the other solvents. A combined solvent might possibly be made by mixing amyl acetate and chloroform or carbon tetrachlorid.—*Pharm. Journal* per *Brit. Dental Journal.*

Casting Aluminum Splints for Fractures of the Mandible.—The fractured parts are reduced and temporarily retained by wiring, or with an external plaster splint. A sheet of base-plate wax is pressed over the occlusal surfaces of all the lower teeth, and if several teeth are missing, is pressed against the gum. Another sheet of wax is added and the patient's jaws closed, giving an imprint of the occlusal ends of the upper teeth. Another sheet of wax is pressed around the external inferior border of the mandible, extending as far back as the angle of the jaw, or it may extend upward along the ramus and be as wide as the operator wishes.

Wires of No. 10 gage, or bicycle spokes, are well adapted; one end is flattened, turned at right angles and embedded in wax over the occlusal portion, and the other end is threaded and, passing through sheaths, embedded in wax around the margin of the mandible. As many wires may be utilized as the case demands. While the parts are *in situ*, they are chilled, removed from the jaw, and duplicated with aluminum by the casting process.—J. H. Beeson, *Items of Interest.*

Prophylaxis of the Oral Mucosa.—As a prophylactic means calculated to keep the oral *mucous membrane* in a healthy condition, too much emphasis cannot be laid on the necessity for careful examining to see that there are no sharp corners or edges on any of the teeth. Many an epithelioma might never have developed had the teeth been so ground and polished as to avoid their becoming a source of constant irritation. We treat the oral mucous membrane to guard the teeth, and we treat the teeth to guard against disease of the oral mucous membrane. Indeed, the rounding off all sharp corners and edges is about the only true *prophylactic* precaution looking toward the maintenance of a perfectly normal and healthy lip and cheek lining.—F. W. Low, *Xi Psi Phi Quarterly.*

Mouth-props in Anesthetizing Patients with V-shaped Maxillæ.—All anesthetists, before administering an anesthetic, should examine the mouths of their patients, not for the presence of artificial teeth but in order to see whether the upper jaw is properly formed, as in all cases of V-shaped upper jaw and arrangement of teeth there is certain to be trouble with the breathing when the early stages of insensibility are reached. In the worst cases, which are not infrequent, the administration of the anesthetic has to be stopped and the mouth opened with a Mason's gag to get the tongue forward. This, hurriedly done, and with some force, is apt permanently to loosen some of the side teeth. Were a well-made broad prop used in these cases to keep the mouth open, and carefully placed between teeth able to bear the pressure, the tongue could be easily got at, and the anesthetist, forewarned, would no doubt adopt other measures of a precautionary nature during the administration.—J. Fairbank, *Lancet.*

Points in the Selection of Disinfecting Methods.—In the selection of the methods of disinfection we must consider: (1) The composition of the object to be disinfected and its liability to injury by the disinfecting agent. (2) The resistance of the organisms to be destroyed. (3) The disinfecting power of the agent to be applied. (4) The resistance which may be offered to the disinfecting agent by the form of the object, by the layers of dirt or fat which may envelop it, or by chemical changes which its contact with the disinfectant will cause.

For the removal of bacteria the following means are at our disposal: (1) Mechanical removal, by washing and scrubbing. (2) Destruction by heat. (3) Destruction by chemical germicides.—H. W. Anderson, *Xi Psi Phi Quarterly.*

Stress on Abutment Crowns and How to Cope with It.—In the buccal regions the maximum stress falls vertically—a splitting stress—in the line of the long axis of the tooth, and is best met by bands with flat copes (shells) or slanting copes (shells faced with porcelain); the lateral stress is slight and may be met by short posts, though we question the wisdom of weakening molar and bicuspid roots by adjusting posts; in the upper labial region the stress falls outwardly at a sharp angle to the long axis of the tooth and calls for a root post with copes, concave to the root face always, banded if you please; in the lower labial region we have a combination of both downward and inward forces, and the post, or the band high lingually to the jacket, or both, may be used. —C. J. Grieves, *Dental Brief.*

Polishing Silicate Cement Fillings.—The highly polished surface seems to be the ideal one, but in some fillings it is impossible to get such a surface, while in others it can be readily produced. The gelatin matrix, if it could be so applied as to make subsequent polishing unnecessary, would possibly give a surface that would remain impervious to moisture, but how can a matrix be so applied? The instant a polishing strip is drawn over the filling all the high gloss left by the gelatin is destroyed and conditions are the same is if no matrix had been used. The matrix can do no more than prevent a large excess of material at inaccessible places, and whether it be gelatin or celluloid can make no difference. The filling must afterward be polished anyway, in the same way as an amalgam or a gold filling made with a matrix.—G. C. Poundstone, *Dental Review.*

The Final Finish of Gold Fillings.—The final finish on all gold fillings, except those in incisors, should be of a mirror-like polish. Those in the incisors should be of a perfectly smooth but dull finish, for the reason that a high polish, in reflected light, assumes a dark appearance and makes the filling look black. These fillings should be left with a smooth sandpaper finish. But the fillings in the back teeth can be polished to the highest degree with the best results both as to appearance and durability, for it needs no argument to convince anybody that a smooth, highly polished surface will not catch and retain the débris of the mouth as easily as a rough or not so highly polished surface. This high polish may be obtained with a moosehide disk charged with wet pumice powder, followed with a rubber disk charged with a dry pumice powder.—J. V. Conzett, *Dental Digest.*

Hints for Using Sandpaper Disks.—The sandpaper disk is used at the discretion of the operator, but is never to be used between the teeth—that is, it is not to be used between the contact point and the approximating tooth. It may be and is used to great advantage in dressing down the filling and shaping the contour of the tooth. We find that the most convenient way to use it is at a right angle. Right-angle disk carriers may be obtained at any supply house. These are so handy that the straight mandrel is rarely needed.

In order to prevent the sandpaper disk from catching in the dam and tearing it off the teeth, the rubber all around the tooth is greased with vaselin. This will not only prevent the catching of the disk in the rubber, but will as well lubricate the disk and prevent the heating of the filling by friction. —J. V. Conzett, *Dental Digest.*

Removal of Impacted Third Molars.—The method used in the removal of impacted third molars, as suggested by Dr. C. Edmund Kells, Jr., of New Orleans, is to place the patient under nitrous oxid, and then, with a No. 8 or No. 9 bur, following the free margin of the gum, release the tissue around the tooth by drilling the process buccally and distally, until a groove is formed around the tooth in the mandible. On recovery of the patient the gum tissue is released from the bone, the bur can be inserted under the margin of the gum tissue, and the operator can continue to drill with far less inconvenience to the patient while conscious than would be occasioned by a tooth-cavity prepa-

ration. However, the bur should be inserted under the free margin of the gum before the dental engine is started, as the blades of the bur will pick up the tissue and cause pain. If the blades of the bur fill, the shank of the bur heats up, and when coming in contact with the tissue, causes pain, as well as when tissue is touched which has not been severed from the bone at any point surrounding the tooth. Great care should be taken to prevent such conditions. During the drilling, while the patient is conscious, the probe is often inserted to see to what depth the bur has cut, and when the tooth has been well released all around and well toward the apex, the patient is given nitrous oxid; then a lower alveolar forceps is applied to remove the tooth with a lateral motion as well as by lifting it up and backward from the socket, taking it out in the way of the least resistance.—A. B. Allan, *Dental Review.*

Local Treatment of Leucoplakia.—The local treatment of leucoplakia consists of putting the mouth in a strictly healthful condition. All carious cavities should be filled, all abnormal accumulations on the teeth removed, strict oral prophylaxis observed, and all ill-fitting pieces of prosthetic work replaced by well-fitting ones.

Tobacco and all foods calculated to irritate the mucous membrane should be interdicted, and the physiological resistance of the patient increased by tonics, proper exercise, simple diet, and other hygienic measures.

Local treatment of the patch is seldom efficacious except it be accompanied by constitutional treatment. Painting the plaque with balsam of Peru, with a twenty per cent. solution of potassium iodid, and with equal parts of the tinctures of aconite and iodin have been recommended. Alkaline mouthwashes, borax and honey on the denuded surfaces, and other palliative treatment will diminish the pain. Anti-syphilitic treatment should, of course, be given when indicated. As a last resort, and the only resort if cancer cells have developed, surgical interference should be sought.—J. E. Hunt, *Dental Summary.*

Dangers of Hasty Setting of Narrow Saddle Bridges.—It must be recognized that there are many dangers incident to the hasty setting of narrow saddle bridges in the mouth.

(1) As there may be a slight deviation from the parallel in the abutments, the bridge should be worn loose and allowed to settle, by adjusting, grinding and polishing all contact points; particularly is this true of cases where it is necessary to open the bite, and where pressure from the unduly contracted muscles of mastication is constant on the bridge.

(2) There should be ample cutting space before the bridge is set, between the cervices of the dummies directly adjacent to the abutment crowns and the margins of such, to allow these margins to be adjusted, and to prevent the gingival hypertrophy always produced in these regions.

(3) In setting such bridges the attaching cement may flow under the saddle and quickly become a source of infection. This must be met by greasing all exposed parts of the bridge and wrapping each interproximal space with floss, which, after the bridge is set, may be swept back and forth, dislodging all excess of cement.

(4) Great judgment should be exercised in selecting teeth for abutments only in such cases as present a normal mucosa and healthy pericemental membrane.—C. J. Grieves, *Dental brief.*

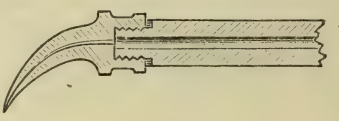
Pure Carbolic Acid versus Silver Nitrate in Open Ulcers About the Mouth.—In open ulcers about the mouth, such as aphthous stomatitis or ulcerative gingivitis, the properties desired for a remedial agent should be about as follows: The agent should be both rapid and powerful, as the period of application must be comparatively short; its application should not be too painful, and preferably it should destroy diseased tissue but not be deeply caustic. Pure carbolic acid answers many of these requisites, but its application is somewhat painful, at least temporarily, and unless applied with great caution it is liable to exercise an undesirably deep escharotic effect.

For such conditions silver nitrate is the remedy of choice. It ranks among our most powerful and rapid germicides and its caustic action, while very thorough, is only superficial, because it is immediately precipitated by albuminous tissues. The coating of albuminate of silver which is formed over the ulcer not only prevents a deeper cauterizing effect of the drug, but being itself a highly unsuitable medium for the growth of bacteria, affords a protecting layer beneath which healthy granulation processes may go on uninterruptedly. The use of the solid stick of silver nitrate, the so-called lunar caustic, seems to offer an almost ideal method of treating open ulcers.—H. C. Wood, *Dental Brief.*

HINTS, QUERIES, AND COMMENTS.

INSTRUMENT FOR ADJUSTING THE FACING TO A RICHMOND CROWN IN THE MOUTH AND FOR SETTING CROWNS WITH GUTTA-PERCHA.

After making the cap and post of the Richmond crown, the facing is ground to fit. The facing is then waxed to the backing on the cap, and the cap placed on the root. For heating the facing and wax in the mouth just enough to allow of a changing of the position of the facing, an instrument with a hypodermic needle as a point can be used to advantage. This instrument may be constructed in the following way: The hypodermic needle is screwed on one end of a hollow handle of some description, and a small rubber tube on the other end, so that connection with a gas-cock can be made. The gas is turned on slightly and lighted at the needle point, so that a flame of only about one-eighth of an inch in length is obtained. The patient's lips are held away from the Richmond crown, and the flame is directed on the facing for but a few seconds, which will sufficiently soften the wax to allow of an adjustment of the facing. The crown can then be removed and finished. A reinforced curved needle, the point of which has been broken off, will answer the purpose very well. The opening need not be enlarged.



For the setting of crowns with gutta-percha or removing crowns thus set, a similar useful instrument may be constructed in the following way: A piece of brass tubing of about four or five inches length is threaded at one end so that a hypodermic needle point can be screwed to it (see figure). The brass tube may be fitted with a black rubber casing, which can be finished nicely. If, in addition, the uncovered portion of the brass is nickeled, a very nice and useful instrument is obtained.

E. R. Mullett.

Clinton, Iowa.

OBITUARY.

DR. JAMES HENRY MALONEY.

Died, at his home, New Orleans, La., October 31, 1910, Dr. James Henry Maloney, in his seventieth year.

Dr. Maloney was born at Kilrush, county Clare, Ireland, in 1841, and at the age of nine came to this country with his parents, residing in New York. He was apprenticed to Dr. Edward Fielding, a prominent dentist of Brooklyn, and with him went to New Orleans, La., in 1860. In the same year he set up an independent practice and became one of the leading dentists of that city, founding the old New Orleans Dental Society together with Drs. Fred and James Knapp, Kells, Friedrichs, West, and Lawrence. He built up a dental practice that extended over a large portion of the South, including patients from Louisiana, Mississippi, and Arkansas. He was awarded numerous medals at the early exhibitions held in New Orleans for dental work, and was known to the dental profession throughout the country.

In 1866 Dr. Maloney married Miss Eliza-

beth Herbst of New Orleans, four sons—Henry H., Joseph A., Robert J., and Paul W.—and four daughters—Mrs. Emma Geary and Misses Adèle, Alice and Agnes—being born to the couple, and still surviving.

Dr. Maloney was a member of the Knights of Columbus, New Orleans Council No. 714, and of the Supreme Council of the Catholic Knights of America, St. Joseph's Branch 271. He retired from dental practice in 1907.

Brief Necrology.

Dr. C. B. Johnston of New Orleans, La., October 10, 1910, of heart failure.

Dr. Frank B. Owen of Beaumont, Texas, October 23, 1910, in his fifty-fourth year.

Dr. John W. Bender of Shippensburg, Pa., October 24, 1910, in his eighty-fourth year.

Dr. Van Alex Porter of Strawberry Point, Iowa, October 22, 1910. Deceased was a graduate of the Dental Department of the Iowa State University.

Dr. John M. Jacobs of Lawrenceville, Ga., October 11, 1910, in his thirty-ninth year, after prolonged illness. Deceased was twice elected mayor of Lawrenceville.

Dr. Russell O. Calkins of Toledo, Ohio, October 24, 1910, in his twenty-second year, of peritonitis. Deceased was a graduate of the Dental Department of the University of Michigan.

Dr. Frederick J. Mansfield of Burlington, Iowa, October 25, 1910, in his fifty-eighth year, of an apoplectic stroke. Deceased was a graduate of the old Boston Dental College. He was a collector of note, a numismatist of high repute, and an authority on Indian relics.

Dr. Ozora P. Sutherland of Minneapolis, Minn., October 5, 1910, in his forty-sixth year, suddenly on his return from the Isle of Pines. Deceased was a graduate of the Dental Department of the University of Michigan, and at one time an alderman of the city of Minneapolis.

Dr. Perry E. Hall of Ashtabula, Ohio, October 6, 1910, in his eighty-fourth year. Deceased was a pioneer dentist of the Western Reserve, and served in the civil war. He was a very skilful and imaginative mechanic, and very active in civic affairs, being at one time a member of the Ashtabula city council.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL INDEX BUREAU

UNDER THE AUSPICES OF THE

NATIONAL ASSOCIATION OF DENTAL PEDAGOGICS.

ANNOUNCEMENT

Of special interest to Students, Writers, Publishers, Editors, Librarians, Colleges, Dental Societies, etc.

The Executive Committee of the Dental Index Bureau is pleased to announce the plans adopted for the classification and distribution to subscribers of an index of current dental literature.

* * * * *

PLAN OF INDEXING AND CLASSIFYING ARTICLES.

This index will be published in two parts, one being an author index, the other a subject index. The author index will contain all of the writings, biographical sketches and important personal notices, arranged alphabetically according to the author's names; all of the writings of each author together. The subject index will contain all original articles, papers read before societies, editorials, book reviews, important selected articles and abstracts, arranged according to subjects, and the subjects themselves will be so classified and arranged that related subjects will be grouped. All of the writings on each subject will be together. There will also be included in this subject index all of the small items generally known as "practical hints," for as many journals as the funds of the Bureau will permit. It is believed that these items may be indexed for most, if not all, of the journals.

ARTICLES IN EACH JOURNAL SEPARATE.

An important feature in the arrangement of the index will be the grouping of the items under each particular subject in accordance with the journals. For example, for the subject of gold inlays, all of the articles in the DENTAL COSMOS will be together, all of those in the *Dental Review* together, and so for each other journal. It will therefore be possible for one to find quickly all of the articles, on any subject, appearing in those journals which he has in his library, or in any single journal, without looking over the lists for other journals.

PLAN FOR PUBLICATION AND DISTRIBUTION.

The index will be printed in book form and will be distributed to subscribers annually, as soon after January 1st as is practicable. Work is now in progress on the 1909 journals and will be published as soon as completed. The development of definite plans has materially delayed the work for this year.

The type metal from which the annual index is printed will be kept standing, and at the end of each fifth year the five yearly indexes will be combined and published as a single volume. In publishing this volume, the items for each journal under each subject heading will be grouped together, so that for each subject the articles which have appeared in each journal will be in their proper chronological order. This will give every fifth year, in a single volume, a complete index classified by authors, by subjects, and by journals under each subject, for all of the dental journal literature of the preceding five years.

The committee has considered carefully all other plans of supplying this index to the subscribers to the Bureau, and believes this plan to have many advantages over all others. It will be the most convenient to us and will occupy little space. A card system would for this purpose be too expensive and too bulky, in addition to the danger of loss of items by the removal of cards.

COST TO SUBSCRIBERS.

The plans of the Bureau have been developed on the basis of one hundred subscribers at $25.00 each per year—$2500.00. It is believed that when the work has been properly systematized it will be possible to do the indexing of two years for that amount, and it is the intention to use surplus funds to index the literature previous to 1909.

COST PER SUBSCRIBER CAN BE MUCH REDUCED.

The committee has in hand or in sight about seventy-five subscriptions for 1909, 1910, and 1911, and anticipates no difficulty in securing the full one hundred at $25.00 each. Particular attention is called to the fact that two hundred, or three hundred, or five hundred copies of the index can be published at very slight additional expense and it will therefore be possible to materially reduce the cost per subscriber by securing additional subscriptions. If the index for the journals mentioned can be furnished to one hundred at $25.00 each, practically the same index can be furnished to two hundred at $12.50 each, or to five hundred at $5.00 each. All subscriptions for the 1909 index will be received with the understanding that any surplus which may accumulate on account of the number of subscribers exceeding one hundred, will be pro rated and applied on the account of each subscriber for the following year.

* * * * *

WHO MAY SUBSCRIBE.

The officers of the Bureau will be pleased to receive subscriptions from individuals, societies, schools, journals, or libraries. A group of dentists may together make up a single subscription and receive a copy of the index to be used by all; a society may subscribe and place a copy of the index in the hands of its secretary, who can supply members with information whenever they wish it, or may place the index in its dental library for the use of its members. It is hoped that enough subscriptions will be received to materially reduce the cost to each subscriber. Not more than $2500.00 will be spent by the Bureau in any year in indexing the literature of the current and past years, so that every subscription over one hundred which is received means a reduction in the cost to all subscribers, the extra amount to be credited on the next year. All subscribers are therefore urged to assist in obtaining additional subscribers.

All subscriptions should be sent to Dr. W. L. Fickes, Secretary-Treasurer, 6200 Penn ave., Pittsburg, Pa.

Very respectfully submitted,

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Dr. W. L. FICKES, *Sec'y-Treasurer*,
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Dr. SHIRLEY W. BOWLES,
826 Vermont ave., Washington, D. C.
Dr. G. W. GETHRO,
Marshall Field Building, Chicago, Ill.

Executive Committee.

NATIONAL DENTAL ASSOCIATION.

Officers for 1910–11.

The list of officers elected at the Denver meeting of the National Dental Association is as follows:

President—Dr. E. S. Gaylord, New Haven, Conn.

Vice-president for the East—Dr. C. S. Butler, Buffalo, N. Y.

Vice-president for the South—Dr. J. W. David, Corsicana, Texas.

Vice-president for the West—Dr. E. R. Warner, Denver, Colo.

Corresponding Sec'y—Dr. C. W. Rodgers, Boston, Mass.

Recording Sec'y—Dr. H. C. Brown, Columbus, Ohio.

Treasurer—Dr. A. R. Melendy, Knoxville, Tenn.

Executive Committee—Dr. Louis Meisburger, Buffalo, N. Y.; Dr. M. F. Finley, Washington, D. C.; Dr. D. M. Gallie, Chicago, Ill.

Executive Council—Dr. H. J. Burkhart, Batavia, N. Y.; Dr. J. G. Sharp, San Francisco, Cal.; Dr. B. Holly Smith, Baltimore, Md.; Dr. C. L. Alexander, Charlotte, N. C.; Dr. A. H. Peck, Chicago, Ill.

The next annual meeting will be held on the fourth Tuesday in July 1911, at Cleveland, Ohio.

SECOND DISTRICT (N. Y.) DENTAL SOCIETY.

A "Taggart" Meeting.

The Second District Dental Society of New York takes pleasure in announcing that its essayist for the December meeting will be Dr. William H. Taggart of Chicago.

Ever since Dr. Taggart startled the dental profession and revolutionized the practice of dentistry by announcing his method of making cast gold inlays, he has been engaging his inventive mind with the problem of overcoming the minor difficulties which, in the past, have made the casting of gold a little short of being an exact science. At the meeting now announced Dr. Taggart will exhibit and demonstrate the use of several appliances with which he has practically, if not absolutely, overcome all the difficulties.

He will show for the first time his newly invented electric annealer, with which the inlay pattern wax is automatically kept at just the proper temperature and consistence, so that the operator at all times may turn to his instrument table and find a piece of inlay wax ready for use. He will exhibit a new appliance wherewith the mixing of his investment material is made so exact that the procedure automatically is repeated every time an investment is required; also a new appliance for removing the wax from the mold without danger to the investment itself.

Using the above appliances and in conjunction with his new investment compound, Dr. Taggart will clinically demonstrate several new methods in connection with casting, including a new technique of making cast base crowns.

The meeting will occur on Monday evening, December 12th, in the Grand Ballroom at Delmonico's in New York city. The meeting proper will be preceded by a bohemian smoker.

All ethical dentists outside of those on the monthly mailing list of the society, if they desire to be present, will please send postcard with their name and addresses to the undersigned, who will then mail the regular invitation when issued, giving all particulars as to how to reach the afternoon clinic and the evening meeting.

Warrington G. Lewis, *Cor. Sec'y*,
162 Clinton st., Brooklyn, N. Y.

DENTAL COUNCIL OF NEW SOUTH WALES.

A Reorganization Plan.

The dentists of New South Wales have adopted a unification scheme by which the dental profession has been practically reorganized, and delegates appointed from each society to form a Dental Council for New South Wales. The following have been elected from their respective societies:

Odontological Society of New South Wales—Mr. G. H. Walker, Dr. E. Deck, Dr. P. C. Charlton, Dr. Basil Jones.

Dental Association of New South Wales—Dr. H. Peach, Mr. W. R. Fitzsimons, Mr. D. P. Foley, Mr. J. S. Darton.

New South Wales Dental Graduates—Dr. Ash, Dr. F. Marshall, Dr. Cozens, Dr. Gates.

University of Sydney Graduates' Association—Dr. C. G. Moxham, Mr. Kirchner, Mr. Neave, and Mr. Hardwick.

Dental Board Graduates' Association—Messrs. Kemmis, Larkin, Wilson, and Ogilvie.

Dental Board of New South Wales—President, Mr. Donald Smith; Drs. Burne, Ash, Magnus, Kelly, and Gledden, Prof. Anderson Stuart, and Mr. A. W. Cleary.

The following officers have been elected: Dr. A. Burne, president; Dr. P. Ash, vice-president; Mr. W. R. Fitzsimons, hon. secretary; Mr. A. W. Cleary, hon. treasurer.

NATIONAL INSTITUTE OF DENTAL PEDAGOGICS.

THE annual meeting of the National Institute of Dental Pedagogics will be held in Washington, D. C., December 27, 28, and 29, 1910.

JOHN Q. BYRAM, *President.*

OHIO STATE DENTAL SOCIETY.

THE forty-fifth annual session of the Ohio State Dental Society will be held in Columbus on December 6, 7, and 8, 1910.

The Great Southern Hotel will be headquarters as heretofore, but additional space will be available, giving more room for the meetings of the society and the clinics.

Come and hear "A Symposium on the Physiology and Pathology of the Sockets and Gums," by men of wide reputation, viz:

Dr. M. H. Fletcher, the president, on "Reparative Powers of Cementum."

"Physiology and Anatomy of the Gums and Sockets," by an essayist yet to be secured.

Dr. T. B. Hartzell of Minneapolis, on "Infection and Pathology of the Gums and Sockets."

Dr. N. S. Hoff of Ann Arbor, on "Instrumentation and Medication of Gums and Sockets."

Dr. Joseph Head of Philadelphia, on "Prophylaxis of Gums and Sockets."

Dr. S. L. McCurdy of Pittsburg, on "Extended Diseases of the Sockets and Bones; Surgical Treatment."

Mark these dates on your appointment book now!

F. R. CHAPMAN, *Sec'y.*

SOUTHWESTERN NEBRASKA DENTAL SOCIETY.

THE seventh semi-annual meeting of the Southwestern Nebraska Dental Society will be held at McCook, Nebr., Thursday, February 23, 1911.

W. A. MCHENRY, *Sec'y,*
Nelson, Nebr.

MARQUETTE UNIVERSITY, DENTAL DEPARTMENT.

ALUMNI ASSOCIATION.

THE fifth annual meeting of the Alumni Association of Marquette University, Dental Department, will be held in the auditorium of the university on January 17 and 18, 1911.

O. G. KRAUSE, *Sec'y,*
Milwaukee, Wis.

UNIVERSITY OF CALIFORNIA, DENTAL DEPARTMENT.

ALUMNI ASSOCIATION.

THE annual meeting of the Alumni of the Dental Department of the University of Southern California, will be held about the third week in December. The entire day will be devoted to clinics and exhibits.

Preparations are now under way to make it a grand success. A large attendance is expected. All practitioners cordially invited.

Programs will be mailed in the near future.

C. J. R. ENGSTROM, *Sec'y-Treasurer.*

G. V. BLACK DENTAL CLUB.

MIDWINTER CLINIC.

THE G. V. Black Dental Club of St. Paul will hold a midwinter clinic in February, 1911. It is our intention to make this meeting the most interesting and profitable of all which we have held.

A cordial invitation is extended to the members of the profession to attend, and assist us in making this meeting the best that has ever been held in the Northwest. Dates and program will be published later.

For further information address

R. B. WILSON, *Sec'y,*
Am. Nat. Bank Bldg., St. Paul, Minn.

TEXAS BOARD OF EXAMINERS.

The Texas State Board of Dental Examiners will meet at Austin, Texas, December 19, 1910, for the examination of applicants for license.

For further imformation address

Bush Jones, *Sec'y*,
Dallas, Texas.

NEW JERSEY BOARD OF REGISTRATION.

The New Jersey State Board of Registration and Examination in Dentistry will hold their annual meeting in the Assembly chamber of the State-house, Trenton, N. J., December 5, 6, and 7, 1910. All applications must be in the hands of the secretary ten days prior to the meeting.

For information apply to

Charles A. Meeker, *Sec'y*,
29 Fulton st., Newark, N. J.

PENNSYLVANIA BOARD OF EXAMINERS.

The next regular meeting of the Pennsylvania Board of Dental Examiners will be held on December 14, 15, 16, and 17, 1910, at the Hotel Stenton, Philadelphia, and in Pittsburg Dental College, Pittsburg.

For further information address the Department of Public Instruction, Harrisburg, or

Alexander H. Reynolds, *Sec'y*,
4630 Chester ave., Philadelphia.

WISCONSIN BOARD OF EXAMINERS.

The semi-annual meeting of the Wisconsin State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Wisconsin will be held at the Wisconsin College of Physicians and Surgeons, corner Fourth st. and Reservoir ave., Milwaukee, beginning Monday, January 15, 1911, at 9 a.m.

For application blanks and general information address

G. C. Marlow, *Sec'y*,
Lancaster, Wis.

NEW HAMPSHIRE BOARD OF REGISTRATION.

The next meeting of the New Hampshire Board of Registration in Dentistry will be held from November 30 to December 2, 1910, at Masonic Banquet Hall, Manchester, N. H.

All persons desiring to practice dentistry are required to take an examination and become registered before beginning practice.

A. J. Sawyer, *Sec'y*,
Manchester, N. H.

RHODE ISLAND BOARD OF REGISTRATION.

The Rhode Island Board of Registration in Dentistry will meet for the examination of candidates at the State-house, Providence, R. I., Wednesday, Thursday, Friday, December 28, 29, and 30, 1910. Application blanks and particulars may be obtained from

H. L. Grant, *Sec'y*,
1025 Banigan Bldg., Providence, R. I.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS.

The next regular meeting of the Board of Examiners for the District of Columbia will be held in the Dental Department of the Georgetown University, January 9, 10, and 11, 1911, beginning at 9 a.m. Applications must be in the hands of the secretary at least five days prior to date of examination.

For further information apply to

Chas. W. Cuthbertson, *Sec'y*,
309 Seventh st. N. W., Washington, D. C.

UTAH BOARD OF EXAMINERS.

The regular meeting of the Utah State Dental Board will be held in Salt Lake City, on December 6 and 7, 1910.

All persons desiring to secure licenses should address the secretary and procure applications. Applications must be returned to the secretary, with the fee of twenty-five dollars, not later than December 1st.

For further information address

A. C. Wherry, *Sec'y*,
Salt Lake City.

SOUTH DAKOTA BOARD OF EXAMINERS.

The South Dakota State Board of Examiners will hold its next meeting at Sioux Falls, S. D., January 10, 1911, beginning at 1.30 P.M., and continuing three days. All applications for examination, together with a fee of twenty-five dollars, must be in the hands of the secretary by January 1st. Applicants who have not complied with the above will not be permitted to take the examination.

For further information, blanks, etc., address

Aris L. Revell,
Lead, S. D.

ARMY DENTAL CORPS.

Changes of stations and duties of dental surgeons, U. S. Army.

For the month ending October 29, 1910:

George D. Graham, September 15th, reported for duty at Fort Shafter, Hawaiian Territory.

Hugh G. Voorhies, granted leave of absence for one month, to take effect about October 24th.

J. A. McAlister, granted leave of absence for one month, with permission to visit China and Japan, effective about November 1st.

G. I. Gunckel, ordered to Fort Oglethorpe, Ga., for temporary duty, for a period of eight weeks.

For the week ending November 5th:

George I. Gunckel, October 22d, granted thirty days' leave of absence.

For the week ending November 12th:

Geo. L. Mason, November 1st, left Fort Snelling, Minn., *en route* to Fort Lincoln, N. D., for temporary duty. Reported at Snelling, November 2d.

Samuel H. Leslie, October 27th, reported for temporary duty at Fort Robinson, Neb.

George E. Stallman, November 2d, reported for temporary duty at Fort McIntosh, Texas.

J. R. Bernheim, November 8th, granted two months' leave of absence on arrival in San Francisco, Cal.

For the week ending November 19th:

Charles J. Long, November 11th, leave of absence extended twenty days.

George L. Mason, November 14th, left from temporary duty at Fort Lincoln, N. D., *en route* to Fort Yellowstone, Wy.

Robert F. Patterson, November 15th, relieved from duty at Fort Sheridan, Ill., and ordered to the Philippine Islands for duty on transport sailing from San Francisco, Cal., about February 5th.

Julien R. Bernheim, November 15th, relieved from duty in the Philippine Islands, and ordered to proceed to San Francisco, Cal., on the transport sailing from Manila, P. I., about March 15th. Upon expiration of his leave of absence will proceed to Fort Sheridan, Ill., for duty at that station.

R. E. Ingalls, November 9th, granted ten days' leave of absence.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING OCTOBER 1910.

October 4.

No. 971,855, to Wm. F. Lawrenz. Dental casting machine.

No. 971,913, to Eduard Messmer. Dental air-pump.

October 18.

No. 973,343, to J. C. Corcoran. Denture.

No. 973,408, to J. C. Corcoran. Dental apparatus.

October 25.

No. 973,573, to Samuel C. Sims. Dental cabinet.

No. 973,894, to Michael H. Toomey. Dental instrument.

INDEX TO VOLUME LII.

1910.

First pages of monthly issues: JANUARY, 1. FEBRUARY, 133. MARCH, 261. APRIL, 389. MAY, 517. JUNE, 629. JULY, 729. AUGUST, 841. SEPTEMBER, 949. OCTOBER, 1053. NOVEMBER, 1185. DECEMBER, 1321.

ABERDEEN (S. D.) District Dental Society, announcement, 256
Abraded surfaces and exposed processes, euroform paste for, J. P. Buckley on, 434
Abrasion, chemical and mechanical, of the teeth, 804
Abscess, acute alveolar, general treatment for all cases of or painful eruption of third molars, 1043
chronic alveolar, curettage of the alveolus and the root in, 115, 693
incipient, hot water in, J. O. Hall on, 1085
in deciduous teeth, treatment of, 810
with extensive necrosis, report of a case of, J. M. Walker on, 176
Abscessed roots and putrescent pulps, J. P. Buckley on, 430
Abscesses, chronic alveolar, and sinuses of the jaw, successful treatment of, 699
chronic, bismuth paste for, 1264
J. P. Buckley on, 433
Abutment, bridge, on a sensitive tooth, gold crown for, 1311
Abutment crowns, stress on, how to cope with, 1416
Abutments, inlays as, 119
Acetanilid, L. F. Kebler on, 307
Acidity of the saliva, alkaline treatment for, E. S. Talbot on, 651
Ackermann, Herbert W., death of, 127
Aconite, L. F. Kebler on, 305
Aconitin in facial neuralgia, 1169
Actinomycosis as produced by chewing grains of corn, 937
Acute dacryocystitis, its causes and treatment, 747
Adamantinoma (cystoma) of the mandible, removal of, 113
Adenoid growths in children, diagnosis of, E. G. Seibert on, 573
Adenoids, persistent non-development of parts in spite of removal of, C. A. Hawley on, 1060
B. F. Gray on, 1363
Adrenalin chlorid and formalin in the treatment of hypersensitive dentin, 118
Agen, Dr., on the practical application of oral hygiene to the school curriculum, 907
Aguilar, F. (Spain), greeting to F. D. I., 778
Alabama Board of Examiners, 386
Alabama Dental Association, announcement, 510
Alabama, oral hygiene in, F. A. Johnston on, 66
Alcohol and dental caries, 939
Alexander, Amzi W., obituary of, 503
Allen, C. C., "Professional Opportunity," 1079
Allen, F. W., "Technique of Implantation" (clinic), 576
"The Bing Crown as a Splint for Loose Teeth" (clinic), 576
"Use of Dentate Scalers (Kirk)" (clinic), 576
Allen, H. Jerome, on drugs and the dental profession, 343
Allen, W. H., on the practical application of oral hygiene to the school curriculum, 895
Alloys, the constitution of the pure tin-silver, A. Fenchel on, 20
Aluminum, cutting, 808
melting and casting by the bucket method, 1174
soldering, 1175
Aluminum dentures, 602
Aluminum plates, cast, 812
casting of, 1308
Alveolar abscess, chronic, curetting of the alveolus and the root in, 115, 693
in deciduous teeth, treatment of, 810
Alveolar abscesses, unique, Isidore Lett on, 750
Alveolar processes, the teeth and, as points of entrance for the tubercle bacillus, 1412
Alveoli, infected, H. S. Vaughan on, 656
Alypin in dental practice, 1303
Amalgam and oxyphosphate cement fillings, 700
in children's teeth, H. L. Wheeler on, 145
Amalgam, S. G. Perry on, 1209
Amalgam crowns, 1305
Amalgam fillings, copper matrix in inserting, 702
removal of, 500
Amalgams, some new researches into, and their significance in dental practice, A. Fenchel on, 20
Amberline (Dr. Flagg), for retarding caries and reducing hypersensitivity of dentin, 120
American Circulating Dental Clinic, announcement, 254
American Dental Association, the former, B. L. Thorpe on, 1097
its reorganization, B. L. Thorpe on, 1100
American Dental Society of Europe, announcement, 256, 618
proceedings of, 793
American dentistry, development of, 1322
American Medical Association, Section on Stomatology, announcement, 617
American Miller Memorial, 711
Ammonium, bifluorid of, A. H. Merritt on, 1002
Amputation, of roots, in pyorrhea alveolaris, J. J. Sarrazin on, 549
of root apices or extraction in persistent cases of pyorrhea alveolaris, J. P. Buckley on, 861

Anatomic conditions for the processes of metabolism and sensitivity in hard tooth substances, investigations on the, 110
Anchorage, different forms of, in regulating, 811
improved, 1358
of cast gold inlays, 1044
stationary, for regulating extremely constricted upper dental arches, 808
Andrews, L. S., death of, 706
Anéma, Dr., on the relation of ideal dentures to the ideal lines of the human face, 794
Anemia, pigmentation of the buccal mucosa in, 1310
Anesthesia, cocain, contribution to the study of, 1039
high pressure, points in, 809
local, alypin in, 1303
local, by intra-osseous injection (Otte), B. H. Masselink on, 869
local, by novocain, 1169
local, by novocain, thymol, and sodium chlorid, B. H. Masselink on, 870
local, solution for, 937
local, with quinin, 1413
means of inducing, 294
with nitrous oxid, discovery of, by Horace Wells, addresses on, 670
Anesthetic, a local, J. P. Buckley on, 437
quinin and urea hydrochlorate as a, 1310
Anesthetics, advantages of gradual administration of, 701
local, 365
some local, investigations on the osmotic pressure of, 605
L. F. Kebler on, 307
Anesthetizing patients with V-shaped maxillæ, mouth-props in, 1415
Aneurysm, differential diagnosis between a cyst and, T. W. Brophy on, 953
Angina, Ludwig's, a suspected case of, H. R. Sparrevohn on, 645
due to impacted third molar, H. McIntosh on, 1092
Vincent's, 692
Angle, E. H., "Bone-growing," 261
"Treatment of Malocclusion of the Teeth" (German edition), review of, 600
Angleman, Oscar, death of, 1050
Annealing broaches, 118
Antisepsis and asepsis in crown and bridge work, H. C. Register on, 981
Antiseptic gases, proposed application of, to operative dentistry, 737
Antiseptic value of fillings and dressings, 374
of soaps, 1170
Antrum, maxillary, chronic suppuration of, 377
diagnosis of diseases of, of dental origin, T. W. Brophy on, 950
diseases of, as reflected in the eye, 748
diseases of, H. A. Engelhardt on, 1076
empyema of, 377
empyema of, treatment of, 501
Apex of the root, the, after treatment of the root-canal, results of histological investigations of, 604
perforated, closing of, with subsequent filling of the root-canal by a new method, 375
resection of, failures in surgical root-treatment and their causes, 1163
Approximal cavities, gold inlays for, faced with Jenkins porcelain, W. W. Booth on (clinic), 234
Approximal fillings, importance of smooth surfaces on, 1414
Aqueous and oleaginous solutions in the therapy of caries, 606
Arch, charts for determining the, and measuring instrument, C. A. Hawley on, 587
restoration of, in pyorrhea alveolaris, J. J. Sarrazin on, 549
Arches, constricted upper, regulated by stationary anchorage, 808
contraction or expansion, breaking of, 117
of the deciduous teeth, deficient development of, and necessity of early treatment, J. L. Young on, 1185
practical remarks on the lines of, A. Gysi on, 280
Argilagos, A A., death of, 253
Arizona Board of Examiners, 260, 1183
Arkansas Board of Examiners, 625
Army Dental Corps, 132, 258, 388, 516, 628, 728, 840, 947, 1052, 1184, 1320, 1424
Arnone, L., "Phosphor-Necrosis," 424
Arrington, J. A., death of, 706
Arsenical poisoning in pulp-devitalization, prevention of, 500
Arsenous acid, methodical use of, in the painless devitalization of the pulp, 496
treatment of epulis with, 1039
versus arsenic acid in devitalization of the pulp, 1171
Arsenous dressings, method for the exact retention of, without pressure, 1169
Art in dental prosthetics, N. S. Essig on, 1066
Arthritis, dental, characteristic reaction of the saliva in, 1410
Articulation, historical synopsis of, A. Gysi on, 1
problem of, A. Gysi on, 1, 148, 268, 403
Artificial teeth, repolishing, after grinding, 117
correct setting-up of, in lower prognathism, 114
forms of, A. Gysi on, 403
smokers', painting, 1171
Artificial tooth, to determine the shade of an, 937
Asafetida, L. F. Kebler on, 305
Ash, C. F., on oral prophylaxis as a special field of work in dentistry, 923
on relief of pain during dental operations, 332
on report of the Committee on Practice (New York State Dental Society), 1008
Astringent, an, in the medical treatment of pyorrhea alveolaris, J. P. Buckley on, 860
Asylums, state, dental service in, W. W. Belcher on, 455
Asymmetry of the hard palate, 1311
Atlanta Dental College, commencement of, 820
meeting of Alumni Association, 618
Atrophy of the hard structures of the teeth and tuberculosis, 1041
Augusto, A., "The Barring of the D.D.S. in Italy" (correspondence), 325
Austrian empire, dentistry in, N. S. Jenkins on, 1329

Babcock, E. H., on sectional inlays, 1293
Bacterial action in the large intestine, A. W. Doubleday on, 291
in the small intestine, A. W. Doubleday on, 290
Bacterial plaque, experimental, production of the, 737
Bacterial standpoint, pyorrhea alveolaris from a, T. Leary on, 52
Bacterial vaccines, some observations on the bacteriology of pyorrhea alveolaris and its treatment by, 495
Bacteriological investigation on some modern mouth-disinfectants (formamint and pyocyanase), 243

Ballachey, F. A., on free dental dispensary service, 477
on tumors, 362
Ballard, W. H., death of, 1050
Balsam of Peru, Mayrhofer's treatment with, for putrescent pulps, W. A. Dean on, 1263
Baltimore College of Dental Surgery, commencement of, 708
founding of, 1322
Baltimore Dental College, commencement of, 817
Bandaging teeth in pyorrhea alveolaris, J. J. Sarrazin on, 548
Bands, how to cement, especially in retention appliances, 1171
Banks, M. A., death of, 1178
Barber, C. J., on free dental dispensary service, 477
Barclay, A. C., on the treatment of children's teeth, 225
Barnes Dental College, commencement of, 819
Bartlett, J. W., death of, 504
Bean, James H., death of, 1178
Beebe, J. H., "Pot-pourri," 362
on free dental dispensary service, 477
Belcher, W. W., "God's Poor, and a Few Poor Devils," 444
Belford, E. E., "Advantages of the Snow Bow in Plate Work" (clinic), 577
Belgium, dentistry in, N. S. Jenkins on, 1330
Belladonna, L. F. Kebler on, 305
Bender, John W., death of, 1419
Benefaction, A Remarkable (editorial), 598
Benevolent, a, dental association, J. McManus on, 1125
Bicuspids, four first, absence of, M. F. Finley on, 586
Biddle, J. F., on the treatment of children's teeth, 225
Bifluorid of ammonium, in pyorrhea alveolaris, A. L. Swift on, 1134
R. G. Hutchinson on, 1140
A. H. Merritt on, 1002
Billings, G. D., death of, 253
Bing crown as a splint for loose teeth, F. W. Allen on, 576
Birmingham Dental College, commencement of, 945
Bishop, Henry F., death of, 380
Bismuth paste, for chronic abscesses, 1264
for packing in pyorrheal pockets, J. J. Sarrazin on, 542, 545
J. P. Buckley on, 434
Bite in edentulous cases, taking the, 117
taking the, and assembling a bridge, a simple and accurate method of, J. A. Rupert on (clinic), 234
Black, A. D., "Systematic Indexing and Classification of Dental Literature and Its Possible Results," 629
Black, G. V., "Reply to Dr. Fenchel's Open Letter" (correspondence), 199
on some fallacies in orthodontia, 229
rejoinder to his reply to open letter, by A. Fenchel (correspondence), 456
Blaisdell, E. C., "Prophylaxis" (clinic), 575
Bleaching of porcelain fillings, L. E. Custer on, 1221
teeth with pyrozone and sodium dioxid, 701
Bliven, C. F., on true art in dental prosthetics, 1123
Blowpipe, oxyhydrogen, manipulation of, C. V. Mierley on (clinic), 234
the gas, C. S. Van Horn on, 878
Boarts, J. A., "Missing Teeth Supplied by Roach Attachments" (clinic), 234
Bogue, E. A., "Orthodontia," 1223
on deficient development of dental arches, and necessity of early treatment, 1242
on measures to protect the dentist and his *clientèle* from tuberculosis, 1387
Bone-growing, E. H. Angle on, 261
Bookkeeping, dental, C. J. Mess on, 584
Booth, W. W., "Gold Inlays for Approximal Cavities Faced with Jenkins' Porcelain" (clinic), 234
on the application of successful business principles in dental practice, 217
Bowles, S. W., on drugs and the dental profession, 345
Bowman, F. H., "Some Experiences with Tartar Solvent" (correspondence), 63
Bowman, G. F., "Some Fallacies in Orthodontia," 191
Brabson, B. D., on oral hygiene, 1121
Brachycephaly and dolichocephaly, the effects of, on the teeth of man, R. C. Osburn on, 517
Bradford, A. J., death of, 1315
Bradford, T. G., "Surgical Operation of the Frenum Labii Superioris," 986
Bratt, C. B., on preventive measures for the protection of the dentist and his *clientèle* from tuberculosis, 1388
Brav, Aaron, "Oral Prophylaxis as a Means to Prevent Ocular Diseases," 745
Bread, importance of, in the production of dental caries, 695
Breath, fetid, treatment of, 1172
Brewster's or Steele's facings, to remove from a bridge out of the mouth, 377
Bridge abutment on a sensitive tooth, gold crown for, 1311
Bridge, assembling, a simple and accurate method of taking the bite and, J. A. Rupert on (clinic), 234
fixed, replacing a broken tooth in a, 1042
out of the mouth, to remove Brewster's or Steele's facing from, 377
Bridge and crown, the physico-prosthetic, with reference to fundamentals, H. C. Register on, 973
Bridges, narrow saddle, dangers of hasty setting of, 1417
new method of repairing, 1308
small, a very simple method of casting, 939
Bridges and crowns, construction of, without casting against the porcelain, 249
Bridge tooth, broken, replacing a, 249
Bridge work, an improvement on the transverse bar of Bryan in, 607, 696
fixed, without displaying gold or destroying the pulp (anterior teeth), J. M. Crosby on (clinic), 234
in pyorrhea alveolaris, W. O. Talbot on, 855
Briggs, F. C., death of, 706
Brittleness of gold, how to overcome in casting, 608
Broaches, annealing, 118
Brockway, Albert H., obituary of, 941
Broken tooth in a fixed bridge, replacing a, 1042
Bromural and its application in dentistry, 602
Broomell, I. N., "Anatomy and Histology of the Mouth and Teeth," review of, 492
on tuberculosis and preventive measures for protection of the dentist and his *clientèle*, 1385
"The Adventitious Effect of Large Masses of Gold in Contact with Tooth Tissues," 389
Brophy, T. W., "Incidents in the Practice of an Oral Surgeon," 949
"The F. D. I. Miller Memorial," 1102

Brower, E. D., obituary of, 1314
Brown, G. V. I., on public oral hygiene, 69
on the question of susceptibility and immunity to dental caries, 763
Brown, W. T., on the relief of pain during dental operations, 331
Bryan transverse bar, an improvement on, in bridge work, 607, 696
Buchanan, J. L., on orthodontia, 990
Buckley, J. P., "Is It Necessary to Use Secret Formula Preparations in the Practice of Dentistry," 429
"The Practical Treatment of True Pyorrhea Alveolaris," 856
on the chemical changes of foodstuffs during digestion, 359
on the dentist and the law, 469
Buckley's Materia Medica, W. A. Dean on, 1263
Buell, C. K., on cast gold inlays, 365
on the chemical and physical characteristics of porcelain, 84
Bunting, Russell W., "Potassium Sulfocyanate in the Saliva," 1346
Burning of the gums under a gold plate, 937
Burroughs, Justus C., death of, 706
Burs, cleaning, 938
Burton, H. Stanford, death of, 1050
Business principles, successful, application of, in dental practice, W. G. Ebersole on, 181
Butler, C. S., on dental caries, 482
on insanity, due to painless dental disease, 595
on professional opportunity, 1101

Calcium hypochlorite, for discolored teeth, 933
with iodin in abnormal discoloration of the teeth, 374
California State Dental Association, announcement, 385, 721
Calkins, Russell O., death of, 1419
Cameron, S. P., on some fallacies in orthodontia, 227
Campbell, C. V., "Keeping Impression Trays Clean," 503
Canada balsam for cavity lining, 1042
Canadian Dental Association, 511, 720
Cancerous and syphilitic manifestations of the oral cavity, 1409
Canine root with two crowns, J. Girdwood on, 536
Capon, W. A., "Porcelain Work" (clinic), 581
Carbohydrates and saliva, A. W. Doubleday on, 286
Carbolic acid, pure, *versus* silver nitrate in open ulcers about the mouth, 1417
Carbolic acid and oil of cassia, influence of, on bacterial growth and plaque formation, W. J. Gies on, 1143
Carcinoma of the tongue, 1038
Carcinoma and sarcoma, T. W. Brophy on, 954
Caries, alcohol and, 939
aqueous and oleaginous solutions in the therapy of, 606
causes of susceptibility and immunity in, 730
exciting causes of, L. M. Waugh on, 421
factors in the problem of the etiology of, 800
facts in regard to, that today are well established, 731
importance of bread in the production of, 695
in relation to saliva, investigations on plaque formation and, L. M. Waugh on, 170
mucin in relation to the bacterial plaque, 735
Caries, neglect of certain aspects of the subject of, 732, 800
nutritional status in relation to, 733, 800
predisposing causes of, 421
prevention of, need for co-ordination in present movement for, 801
reaction of the oral fluids in, 733
retarding and reducing hypersensitivity of dentin, "amberline" (Dr. Flagg) for, 120
secondary, from lactic ferment medication, 694
some experiments on the relative susceptibility of the different teeth to, 1306
statistics of, need of broader recognition of factors in the compiling of, 800
studies on potassium sulfocyanate and its effects as to, 1347
susceptibility and immunity to, as related to and varying with the nutritional status, 733
L. M. Waugh on, 420
Caries and plaque formation, W. J. Gies on, 1141
Carpenter, D. N., "A Report of Two Cases of Dentigerous Cysts," 283
on drugs and the dental profession, 344
Carter, Ernest F., death of, 1178
Carter, Moses W., death of, 1050
Cassia, oil of, and carbolic acid, influence of, on bacterial growth and plaque formation, W. J. Gies on, 1143
Cassill, Wm. B., death of, 504
Cast aluminum plates, 812
Cast crown, all-gold, C. L. Kemery on (clinic), 234
Cast crowns, hollow metal, H. C. Neale on (clinic), 235
Cast gold filling, relative merits of the malleted and the, D. H. Squire on, 57
Cast gold inlay, final finishing of, 809
with porcelain face, J. C. G. Fitz-Hugh on (clinic), 235
A. H. Merritt on, 1000
Cast gold inlays, anchorage of, 1044
hollow, repair of perforated gold crown with, 1037
pin-locked, in abutment teeth, 810
removing wax model and pins together in, 703
Cast inlays, with pins, 1170
Casting, a review and commentary, including a technique which makes possible a casting of the same size as the wax pattern, at body temperature, C. S. Van Horn on, 873
investing the wax model in, 1414
pattern waxes in, C. S. Van Horn on, 879
some causes of failure, C. S. Van Horn on, 879
the gas blowpipe in, C. S. Van Horn on, 878
uniformly good investing materials for, 1043
Casting against metal parts, 699
Casting aluminum plates, 1308
Casting and melting aluminum by the bucket method, 1173
Casting device, an original, of the Igorots, H. E. Friesell on, 578
Casting devices, C. S. Van Horn on, 878
Casting gold inlays, an original method for, 246
Casting gold plates with porcelain teeth, without "checking," by the use of vacuum machine, 795
Casting hollow seamless gold dummies, original method of, 704
Casting of gold, new material of stony hardness for, 795

Casting process, application of, in a combined pin and tube tooth, on a bicuspid with diverging root-canals, 493
Casting pure aluminum plates, 809
Casting rings for inlay work, W. A. Heckard on, 894
Casting small bridges, a very simple method of, 939
Castings, gold, wax models for, R. Porter on, 235
Cast upper metal denture with suction chamber, 604
Catarrhal inflammations, acute, H. S. Vaughan on, 657
Caustic soda and sodium subchlorid, Lepkowski's new root-canal treatment, 692
Cautery, galvano-, for sterilizing root-canals, 251
Cavities, in hypersensitive teeth, nitrous oxid and oxygen as an aid in the painless preparation of, C. E. Peters on (clinic), 235
involving the incisal edge, preparation of, 1173
simple approximal, matrix formation for, 1173
Cavity lining, Canada balsam for, 1042
Cavity preparation, for gold inlays, H. M. Davidson on, 1260
for inlays, hand instruments in, 1171
J. E. Storey on, 1256
principle of, for gold inlays, J. V. Conzett on, 1340
steps in, W. A. Price on, 1021
Celebration in honor of Dr. G. V. Black, 128
Celluloid, in dental technics, investigations on the applicability of, 109
solvents for, 1415
Cement, chemical constitution of, C. M. McCauley on, 1226
coloring agents in, C. M. McCauley on, 1227
hydraulic, for setting gold inlays, D. M. Gallie on, 1369
influence of, upon the color of a porcelain inlay, 1311
proper mixing an important requisite for, C. M. McCauley on, 1228
Cement liquid, C. M. McCauley on, 1227
Cement (oxyphosphate) and amalgam fillings, 700
Cement mixing slab, cleaning a, 1042
Cements, oxyphosphate, C. M. McCauley on, 1225
silicate, A. H. Merritt on, 1000
tests for the selection of, C. M. McCauley on, 1226
Charity, dentists', W. W. Belcher on, 445
Cheadle, Emery M., death of, 504
Checking of soldered porcelain facings, causes of, and the soldering of gold, 696
Chemical changes of the foodstuffs during digestion, A. W. Doubleday on, 285
Chicago College of Dental Surgery, commencement of, 821
Chicago Odontographic Society, announcement of, 514
Children, care of the teeth of, 1024
during first dentition, dental care of, 700
filling operations in, 702
Forsyth Dental Dispensary for (editorial), 598
treatment of, by the dentist, 741
Children's teeth, care of, 738
caries in, sex and other relations of, 800
causes of failure of gold and amalgam fillings in, 742
condition of, in New South Wales, 755
inadvisable method of filling, 742
indications for permanent or temporary fillings in, 742
Children's teeth in New South Wales, report of the condition of, 755
iodoformogen and copper oxyphosphate for filling, 743
methods and materials for preserving, 742
rapid method of filling, 743
sex relations of caries in, 800
statistics of caries in, in urban and country schools of New South Wales, 755
treatment of, H. L. Wheeler on, 144
Chin, retreating, a case of protruding upper incisors and, A. H. Ketcham on, 961
Chip-blower, an improved, 1173
Chloro-percha for lubricating root-canals, how to make, 700
Christ, J., on the action of the pancreatic secretion on starch, 1272
Christensen, Carl (Denmark), greeting to F. D. I., 778
Christian, W. K., death of, 380
Cincinnati College of Dental Surgery, commencement of, 708
Clamp bands and expansion arch, simultaneous use of in regulating teeth, 1310
Clamp bands in orthodontia, separation preliminary to applying, 1173
Clapp, G. W., on the application of successful business principles in dental practice, 219
Classification and systematic indexing of dental literature and the possible results of, A. D. Black on, 629
Cleanliness in the dental office, J. M. Weems on, 1268
Clean mouth, esthetic viewpoint of, 745
Cleft-palate cases, advancing the jaw in, 117
Cleft palate and hare-lip, complicated, surgical management of, 494
Clinics, dental, in Manila: schools, prison, hospital, and orphanage, L. Ottofy on, 887
Clinton, Marshall, "Tumors," 314
Cocain, chlorhydrate of, sterilization of aqueous solutions of, 938
Cocain anesthesia, contribution to the study of, 1039
Cocain poisoning, treatment of, 1310
Codrenin for pulp-devitalization, 802
Cold water before taking an impression for an artificial denture, 809
Collapse from hemorrhage, 1310
College faculties, Rip Van Winkles in American dental, 298
College of Dental and Oral Surgery of New York, commencement of, 823
College of Physicians and Surgeons of San Francisco, commencement of, 818
Colorado College of Dental Surgery, commencement of, 819
Collier, A. J., obituary of, 126
Commercial Philanthropy (editorial), 486
Concerning Money and Some Other Things (editorial), 236
Condensation of gold fillings, 61
Congenital deformity of the mouth, 812
Connecticut Dental Commissioners, 625, 1183
Connecticut State Dental Association, announcement, 383
proceedings of, 1013, 1122
Conrad, W., on public oral hygiene, 69
Constantini, C. L., "Construction of the Jackson Crib" (clinic), 588
Consumptives, dental treatment for, W. W. Belcher on, 451
less dangerous than their infected environment, 1333
Contact point, restoration of, by gold inlays, R. Ottolengui on, 1373
ideal, H. E. Friesell on, 578

Continuous gum denture, the, 252
Contours and interproximal spaces in filling operations, W. A. Price on, 1015
Contraction of gold, method of controlling, W. A. Price on, 1017
method of modifying, W. A. Price on, 1022
Contraction or expansion arches, breaking of, 117
Convenience form of cavity preparation for gold inlays, J. V. Conzett on, 1344
Conzett, J. V., "The Gold Inlay," 1339
Cooke, A. R., on pyorrhea alveolaris, 1133
Copper matrix in inserting amalgam fillings, 702
Copper oxyphosphate, applied to sulci of newly erupted first and second molars as a preservative, 794
Copper poisoning manifested in the oral cavity, 936
Corley, J. P., "Oral Hygiene: Inauguration of the Present Movement," 1117
"Replacing Broken Facings in the Mouth" (clinic), 579
"Replacing Broken Facings" (clinic), 585
"Some Uses of the Hemostat in Dentistry" (clinic), 586
on diagnosis of adenoid growths in children, 571
on oral hygiene, 1107
on the "new school" orthodontists and excessive expansion, 998
report of Committee on Oral Hygiene (National Dental Association, Southern Branch), 1103
Cornelius, J. J., death of, 706
Cornish, Rebecca Rauch, obituary of, 253
Corrosion of steel caused by paper, 1313
Corrosive sublimate, action of hydrogen sulfid on, 1414
Council on pharmacy and chemistry, a dental, L. F. Kebler on, 308
Crampton, C. W., on the practical application of oral hygiene to the school curriculum, 900
Crane, A. B., on dentigerous cysts, 347
Crawford, James Y., an appreciation of, by B. L. Thorpe, 995
obituary of, 611
on modern oral hygiene, 75
Creasote, treatment of paradental cysts by cauterization with, 499
Creasote-iodoform as a caustic in deciduous teeth, 1038
Creighton Dental College, commencement of, 815
Cresol, H. B. Holmes on, 1219
Crib, Jackson, construction of, C. L. Constantini on, 588
Cronin, Dr., on the practical application of oral hygiene to the school curriculum, 898
Crosby, J. M., "Fixed Bridge Work Without Displaying Gold or Destroying the Pulp (Anterior Teeth) (clinic), 234
Cross bite, the, A. Gysi on, 414
Cross-pin teeth *vs.* straight-pin teeth, N. S. Essig on, 1067
Crown, all-gold cast, C. L. Kemery on (clinic), 234
a, useful at times, C. S. Van Horn on, 438
Davis, strengthening a root for, J. T. Rice on, 583
Davis, with cast gold base, 938
dummy, H. C. Register on, 977
gold, anatomically correct, how to make, 811
gold, for bridge abutment on a sensitive tooth, 1311
gold shell bicuspid with Steele facing, 1312
ideal, for anterior teeth, 379
Logan, a broken, simple method of repairing, 1171
method of holding while polishing, 937
Crown, partial, on first molar, combined with tin inlay, and reinforced internally by dental alloy wire anchorages, J. Girdwood on, 538
preparation of abutment for, in molars, H. C. Register on, 978
repair of perforated gold, with cast hollow gold inlays, 1037
Richmond, a base for a, 1044
shell, method of repairing, 608
solid gold, molar, for a badly broken-down root, E. B. Lodge on, 235
the Bing, as a splint for loose teeth, F. W. Allen on, 576
Crown and bridge, for single-rooted teeth, forms of root-attachment of, H. C. Register on, 977
the physico-prosthetic, with reference to fundamentals, 973
Crown or bridge tooth, replacing a broken, 249
Crowning a canine with gold-backed porcelain facing and gum-colored porcelain body fused over the apical portion, J. Girdwood on, 536
Crowns, all-porcelain, setting, 120
amalgam, 1305
hollow metal cast, H. C. Neale on (clinic), 235
porcelain, on bicuspids and molars, reinforcing the lingual cusp in, E. E. Cruzen on, 584
preparation of teeth for, H. C. Register on, 974
two on one canine root, J. Girdwood on, 536
Crowns and bridges, construction of, without casting against the porcelain, 249
Crown work, a collarless pivot tooth in, 1036
Cruzen, E. E., "Reinforcing the Lingual Cusp in Porcelain Crowns on Bicuspids and Molars" (clinic), 584
Curetting the alveoli in pyorrhea alveolaris, J. J. Sarrazin on, 546
the alveolus and the root in chronic alveolar abscess, 115
Curriculum, dental mechanics as a problem in the (editorial), 1032
Curtis, James W., obituary of, 705
Custer, L. E., "The Bleaching of Porcelain Fillings," 1221
Cyst, mucous, T. W. Brophy on, 951
Cysts, dental, 377
dental root-, on the pathogenesis of, 112
dentigerous, a report of two cases of, D. N. Carpenter on, 283
dentigerous, T. W. Brophy on, 952
exudation, H. S. Vaughan on, 656
paradental, treatment of, by cauterization with creasote, 499
Cystoma (adamantinoma) of the mandible, removal of, 113

Darby, Chas. Hammond, obituary of, 813
Darby, E. T., on ethics, 207
on preventive measures to protect the dentist and his patients from tuberculosis, 1386
Dastre, Professor, address before the F. D. I., 779
address at unveiling of the Wells monument, 671
Davidson, H. M., "Cavity Preparation for Gold Inlays," 1260
Davis, Chas. E., obituary of, 126
Davis, Ernest E., death of, 127
Davis crown, strengthening a root for, J. T. Rice on, 583
with cast gold base, 938

Day, A. W., death of, 127
Dead teeth causing fistulas, new method of diagnosing, 935
Dealers and manufacturers, dental, gifts from, W. W. Belcher on, 447
Dean, G. S., "Ethics," 841
Dean, W. A., "Report of Committee on Pathology, Materia Medica, and Therapeutics," (National Dental Association, Southern Branch), 1261
Death-rate, Mouth Disorders and the (editorial), 1159
Decalcification of badly affected roots in pyorrhea alveolaris, J. J. Sarrazin on, 546
Deciduous teeth, abscessed, treatment of, 810
carious, importance of early treatment of, J. L. Young on, 1189
creasote-iodoform as a caustic in, 1038
deficient development of the arches of, and necessity for early treatment, J. L. Young on, 1185
how to hasten the shedding of, 608
putrescent, treatment of, H. B. Holmes on, 1220
resorption of, and eruption of the permanent, microscopic investigations on, 115
Decker, Wm., death of, 706
in memoriam resolutions on, 942
Defective teeth and gastro-intestinal diseases, 702
Deformities of the jaw associated with malocclusion of the teeth, surgical treatment of, 108
Delair, L., demonstration of direct prosthesis in palatal malformations, 795
De Long, G. F., on preventive measures for the protection of the dentist and his *clientèle* from tuberculosis, 1386
De Long, W. D., "President's Address" (Pennsylvania State Dental Society, 1382
Delta Sigma Delta Fraternity, announcement, 119
Dental Act of 1878 (England), 1326
Dental Board of New South Wales, 723
Dental cements, preserving, 809
Dental Council of New South Wales, 1421
Dental Dispensary for Children, The Forsyth (editorial), 598
Dental educational standards, a new era in, J. G. Sharp on, 1211
Dental Faculties Association of American Universities, announcement, 719
proceedings of, 1399
Dental hygiene, commission on (F. D. I.), 596
public, Albin Lenhardtson on, 1351
Dental Hygiene Council of New York City, announcement, 613
Dental Hygiene Movement, The (editorial), 687
need of co-ordination and concentration of effort in, 801
Dental Index Bureau, 129, 1316
Dental infirmaries, already established, 739
first steps toward establishing, 740
Dental Mechanics as a Problem in the Curriculum (editorial), 1032
Dental science and art, progress of, 1321
Dental Society of the State of New York, announcement, 619
proceedings of, 78, 999, 1126, 1270, 1390
Dentate scalers (Kirk), use of, F. W. Allen on, 576
Dentifrice, a cheap and efficient, 1170
Dentigerous cysts, report of two cases of, D. N. Carpenter on, 283
Dentin, hypersensitive, formalin and adrenalin chlorid in the treatment of, 118
hypersensitivity of, reducing by the use of "amberline" (Dr. Flagg), 120
Dentin, rhachitic changes in, 805
secondary, researches on the development of, 931
sensitive, paraform in the treatment of, 118
Dentist, breath, hands, and instruments of, a possible source of direct tuberculosis infection, 1333
his personal danger of contracting tuberculosis, 1334
office of, a poor contagious environment for tuberculosis, 1333
question of medical or dental education for, 928
Dentistry and the Public Service (editorial), 103
Dentistry, in Italy; the Istituto Stomatologico Italiano (correspondence), 759
Dentistry, in America, 1331
in Austria, 1329
in Belgium, 1330
In France, 1327
in Germany, 1328
in Great Britain, 1323
in Holland, 1331
in Italy, 1330
in Scandinavia, 1331
in Spain, 1328
in Switzerland, 1329
modern, relation of, to the tuberculosis problem, 1411
past and present, as seen by a modern hygienist, L. C. Taylor on, 42
preliminary training for, in Europe, 1331
progress of, in Great Britain, 1323
pyocyanase in, 806
the ancestors of, 1321
twentieth century, W. A. Spencer on, 1089
Dentition, first, dental care of children during, 700
Denture, cast upper metal, with suction chamber, 604
flexible lower, W. H. Mitchell on, 575
full, platinum base for, 608
lower, suction plate for, 703
Dentures, aluminum, 602
artificial, and their dangers, 500
artificial, grinding inaccurately fitting, A. Gysi on, 416
gold and other, practical hints for the making of, 107
rubber, quick repair of, 378
Denuded surfaces and exposed processes, pain from, euroform paste for, 1264
Denver, N. D. A. and other meetings at, announcement, 712
Deputy, A. C., death of, 1179
Dermatol in pyorrhea alveolaris, 609
Devitalization of the pulp, painless, a methodical use of arsenous acid in the, 496
of pulps, in deciduous teeth, by creasote-iodoform, 1038
prevention of arsenical poisoning in, 500
treatment of sensitivity after, 1165
with codrenin, 802
Devitalized teeth, after-treatment of, J. P. Buckley on, 430
diseased roots and, I. Lett on, 194
in pyorrhea, sensitiveness of, 701
Devitalizing paste, 429, 1264
Devitalizing the pulp, arsenous acid *vs.* arsenic acid in, 1171
Devlin, J. L., "The Dentist and the Law," 309
Diabetes, gingivitis in, 1164
Diabetes mellitus, care of the mouth in, 377
Diacetic acid in the saliva, the question of, 1350
Diagnosis, hints for, T. W. Brophy on, 949
of rhachitis by changes in the dentin, 805
the faradic current in, 1312

Dickey, Erskine H., death of, 1179
Dies, zinc, some difficulties in casting, and how to overcome them, 703
Diet, constructing a, 700
Dietetics, P. R. Howe on, 441
Digestion, chemical, changes of the foodstuffs during, A. W. Doubleday on, 285
of food, value of the teeth in, A. Michel on, 1272
Dinner in honor of D. O. M. LeCron, 385
Diphtheria and mouth-disinfection, 1043
Discoloration, abnormal, of the teeth, iodin and calcium hypochlorite in, 374
by silver nitrate removed by potassium iodid, 1040
Discolored teeth, contribution to the pathogenic study of, 1412
treatment of, 932
Discussion on "A Consideration of the Question of Susceptibility and Immunity to Dental Caries," 760
on "A Plea for the Porcelain Inlay," 1252
on "A Report of Two Cases of Dentigerous Cysts," 347
on "Are the New School Orthodontists Practicing Excessive Expansion?" 998
on "A Warning Against Dental Fads," 1254
on "Clinical Experience and Observations in the Treatment of Pyorrhea Alveolaris," 1266
on "Deficient Development of the Arches of the Deciduous Teeth, and the Necessity of Early Treatment," 1241
on "Dental Caries," 480
on "Dentistry, Past and Present, as Seen by a Modern Hygienist," 71
on "Drugs and the Dental Profession," 342
on "Enamel Softening and Rehardening as a Factor in Erosion," 78
on "Ethics," 207
on "God's Poor, and a Few Poor Devils," 476
on "Insanity Due to Painless Dental Disease," 592
on "Oral Hygiene, Inauguration of the Present Movement," 1120
on "Oral Prophylaxis as a Special Field of Work in Dentistry," 915
on "Orthodontia," 989
on "Orthodontia and Orthopedia of the Face, and the Influence of Expansion of the Dental Arches in Establishing Normal Respiration," 1361
on "Oxyphosphate Cements," 1265
on "Pot-pourri," 365
on "Practical Application of Oral Hygiene to the School Curriculum," 895
on "President's Address" (Northeastern Dental Association), 357
on "Professional Opportunity," 1101
on "Pyorrhea Alveolaris from a Bacterial Standpoint," 95
on "Report of Committee on Oral Hygiene" (N. D. A., Southern Branch), 1105
on "Report of Committee on Practice" (New York State Dental Society), 1003
on "Report of Committee on Scientific Research" (Dental Society of the State of New York), 1141
on "Sectional Inlays," 1286
on "Some Advantages of the Stone Model Method in Making Gold and Porcelain Restorations," 1024
on "Some Fallacies in Orthodontia," 226
on "Some Things in Operative Dentistry," 1257
on "Surgical Operation of the Frenum Labii Superioris," 993
Discussion on "Systematic Indexing and Classification of Dental Literature and Its Possible Results," 680
on "The Adventitious Effect of Large Masses of Gold in Contact with Tooth Tissues," 458
on "The Application of Successful Business Principles in Dental Practice," 217
on "The Bleaching of Porcelain Fillings," 1238
on "The Care of the Teeth of Children: Our Duty to the Men and Women of the Future," 1024
on "The Chemical and Physical Characteristics of Porcelain and Their Relation to Its Manipulation," 83
on "The Chemical Changes of the Foodstuffs During Digestion," 359
on "The Conditions of Success," 1282
on "The Dentist and the Law," 469
on "The Gold Inlay," 1367
on "The Practical Application of Oral Hygiene to the School Curriculum," 895
on "The Progress of Dental Science and Art," 1390
on "The Proper Use of a Normal and Hygienic Buccal Cavity, and Its Effect upon the Nutrition of the Body," 589
on "The Question of Medical Education for the Dentist," 99
on "The Relation of Diseases of the Nose and Pharynx to Dentistry," 1113
on "The Relative Merits of the Cast and the Malleted Gold Filling," 91
on "The Relief of Pain During Dental Operations," 327
on "The State Association's Part in the Oral Hygiene Propaganda," 1105
on "The Treatment of Children's Teeth," 221
on "Treatment of Fractures of the Maxillæ," 991
on "True Art in Dental Prosthetics," 1123
on "Tuberculosis—Preventive Measures for the Protection of the Dentist and His *Clientèle,* 1384
on "Tumors," 360
on "What Constitutes a Cure of Pyorrhea Alveolaris, and How May It be Accomplished?" 1132
on "What Medicine and Dentistry Need," 565
on "What We Have to Give," 68
Disinfectants, mouth, some modern, bacteriological investigation on (formamint and pyocyanase), 243
Disinfecting methods, points in the selection of, 1416
Disinfection of the mouth and diphtheria, 1043
of the oral cavity with formamint, 248
Dispensary, free dental, for Rochester school children, R. H. Hofheinz on, 1393
Dispensary service, free dental, W. W. Belcher on, 444, 479
J. O. McCall on, 1154
District of Columbia Board of Examiners, 131, 725, 1423
District of Columbia State Dental Society and Maryland State Dental Association, announcement, 512
proceedings of, 563
Dolichocephaly and brachycephaly, the effects of, on the teeth of man, R. C. Osburn on, 517
Donnally, Wms., on modern oral hygiene, 73
Doubleday, A. W., "The Chemical Changes of the Foodstuffs During Digestion," 285

Drake University, College of Dentistry, commencement of, 943
Dressing after removal of the maxilla, 249
Dressings and fillings, antiseptic value of, 374
surgical, in oral operations, I. Lett on, 323
Drugs and the dental profession, L. F. Kebler on, 303
DuBar, C. L., death of, 1315
Dunham, S. A., on insanity due to painless dental disease, 595
Dunning, W. B., "Report of Committee on Scientific Research" (Dental Society of the State of New York), 1141
on saliva, plaque formation, and dental caries, 1149
Dust of flour, sugar, and mother-of-pearl producing dental disease, 937
Dyer, A. A., "Report of Clinic Committee" (N. D. A., Southern Branch), 1267
Dyer, Walter C., death of, 1178
Dyes, poisonous, producing oral disease, 937

EASTERN Indiana Dental Association, announcement, 383
Ebersole, W. G., "The Application of Successful Business Principles in Dental Practice," 181
on modern oral hygiene, 74
on some fallacies in orthodontia, 230
Edentulous cases, taking the bite in, 117
Education, a broader dental, W. A. Dean on, 1262
dental, of the public, A. Owre on, 642
medical, for the dentist, question of, E. C. Kirk on, 34
Educational campaign, the, R. Summa on (correspondence), 205
the need of, T. W. Brophy on, 954
Educational committee of the Dental Faculties Association of American Universities, report of, by E. H. Smith, 1401
Educational Council of America, a Dental, B. L. Thorpe on, 1100
Educational organization, dental, present status of, A. Owre on, 639
Educational standards, dental, J. G. Sharp on, 1211
Electric furnace, a new, 796
Empyema of the antrum of Highmore, 377
of the maxillary antrum, treatment of, 501
Enamel, artificial, glass spatula for, W. A. Heckard on, 894
Enamel softening and rehardening as a factor in erosion, J. Head on, 46
Engelhardt, H. A., "The Relation of the Diseases of the Nose and Pharynx to Dentistry," 1073
Enzymes and their action, A. W. Doubleday on, 286
Epulis, treatment of, with arsenous acid, 1039
T. W. Brophy on, 953
Erosion, dental, and tuberculosis, 1041
and softening at the junction of the enamel and cementum, a method of treating superficial, 1175
Erupting and impacted third molars, hot water in inflammatory conditions of, J. O. Hall on, 1084
Eruption of the permanent and resorption of the deciduous teeth, microscopic investigations on, 115
of the permanent teeth, mode of, J. L. Young on, 1190
of third molar, tardy, massage in, 1041
Eruption of third molars, painful, or acute alveolar abscess, general treatment for all cases of, 1043
of the teeth, a preliminary note on, 113
Essig, N. S., "True Art in Dental Prosthetics," 1066
Ethics, dental, need of a code of, G. C. Nicholson on, 321
G. S. Dean on, 841
S. G. Perry on, 133
Eucalyptol, J. P. Buckley on, 433
vs. oil of eucalyptus, H. B. Holmes on, 1220
Euroform paste for abraded and denuded surfaces and exposed processes, 434, 1264
Evans, G., on the adventitious effect of large masses of gold in contact with tooth tissues, 466
Evolution, human, the tool-using faculty the main factor in, A. H. Thompson on, 883
Examination for Dental Surgeons, U. S. Army, 259
Excessive jaw-absorption, difficult cases in, 1046
Expansion, are the "new school orthodontists" practicing excessive? A. H. Ketcham on, 956
extreme, some cases of, A. H. Ketcham on, 956
first successful stages of treatment of a case of, A. H. Ketcham on, 956
lateral, of anterior and distal part of the dental arch, 1355
lateral, of lower arch, 1356, 1359
lateral, of whole upper arch, 1356
of the dental arches, influence of, in establishing normal respiration, 1353
of the dental arches, to increase the capacity of the nares, 1358
of the maxilla, indications for, 121
of the upper dental arch, 1353
Expansion and contraction of metals, W. A. Price on, 1016
Expansion arch and clamp bands in regulating teeth, simultaneous use of, 1310
Expansion or contraction arches, breaking of, 117
Extension for prevention, priority of the advocacy of, S. G. Perry on, 1210
Extirpation of the pulp, immediate, W. H. Pearson on, 575
Extracting with the Crane extirpator, J. T. Vivian on, 582
Extraction, deleterious effects of, A. H. Ketcham on, 967
for correction of malocclusion always contraindicated, A. H. Ketcham on, 964
hot water in after-pain from, J. O. Hall on, 1083
indication for, before pyorrhea treatment, J. P. Buckley on, 857
massage in, 1041
of third molars, operative injuries in the, 247
pain after, 250
reckless, of third molars, consequences of, 1414
treatment of wounds after, 1408

FACE, development of, function of the teeth in, C. A. Hawley on, 1053
Facial neuralgia, B. B. Machat on, 1335
Facing, instrument for adjusting to a Richmond crown, 1418
Facings, broken, replacing, J. P. Corley on, 585
broken, replacing in the mouth, J. P. Corley on, 579
interchangeable porcelain, in crown and bridge work, H. C. Register on, 978

Facings, porcelain, some odd cases of, J. Girdwood on, 535
soldered porcelain, causes of checking of, and the soldering of gold, 696
Steele's or Brewster's, to remove from a bridge out of the mouth, 377
Fads, dental, a warning against, G. S. Staples on, 1253
Faradic current in dental diagnosis, 1312
Fats, A. W. Doubleday on, 287
Fats and protein foods, functions of the saliva in relation to, A. W. Doubleday on, 286
F. D. I., Paris Meeting of the (editorial), 596
proceedings of, at Paris, 663
Feces, analysis of, for the determination of proper mastication and assimilation, A. Michel on, 1273
Fees, W. A. Spencer on, 1090
Fellowship medal of the Dental Society of the State of New York, presentation of, 1298
Fenchel, A., "Is Dentistry a Science?—An Open Letter to Dr. G. V. Black (correspondence), 196
"Rejoinder to Dr. G. V. Black's Reply to 'Open Letter'" (correspondence), 456
"Some Researches into Amalgams, and Their Significance in Dental Practice," 20
Ferments, especially lactic ferment, in oral therapeutics, 606
Ferric chlorid test for potassium sulfocyanate, experiments as to the reliability of, R. W. Bunting on, 1350
Ferris, H. C., "Correspondent's Report" (Dental Society of the State of New York), 1270
"Report of Committee on Scientific Research" (National Dental Association), 1234
on deficient development of dental arches and necessity of early treatment, 1242
on enamel softening and rehardening as a factor in erosion, 80
on saliva, plaque formation, and dental caries, 1149
on the question of medical education for the dentist, 99
on the question of susceptibility and immunity to dental caries, 766
Fetid breath, treatment of, 1172
Fickes, W. L., "The Chemical and Physical Characteristics of Porcelain, and Their Relation to Its Manipulation," 48
on measures to protect the dentist and his patients from tuberculosis, 1387
on systematic indexing of dental literature, 680
on the application of successful business principles in dental practice, 218
Files, sharpening, 118
Filings, gold, usable gold plate from, 939
Filling, cement and gold or amalgam veneer, combined, S. G. Perry on, 1208
cement and gold plate matrix combined, S. G. Perry on, 1208
practical porcelain, A. L. Miller on, 580
the gold foil; virtues and drawbacks of, 1339
Filling and inlay, gold, 695
Filling materials, available, S. G. Perry on, 1204
choice of, 938
J. E. Storey on, 1256
Filling operations in children, 702
Fillings, amalgam and oxyphosphate cement, 700
amalgam, copper matrix in inserting, 702
amalgam, removal of, 500
approximal, importance of smooth surfaces on, 1414
compound, of gold and porcelain, restoration of incisal angles with, W. A. Price on, 1023
Fillings of gold and amalgam, failure of, in children's teeth, 742
of non-cohesive gold, 609
silicate cement, polishing, 1416
simplified gold, 246
Fillings and dressings, antiseptic value of, 374
Film-holder, a sterilizable, 1036
Finley, M. F., "Absence of Four First Bicuspids" (clinic), 586
"Jackson's Regulating Appliances" (clinic), 586
on drugs and the dental profession, 345
on tartar solvent, 567
Firman, Chas., obituary of, 941
First and Second District Dental Societies of Louisiana, announcement, 513
First District Dental Society of the State of New York, proceedings of, 206, 458, 680, 760
Fischer, G., "Structure and Development of the Oral Cavity in Man," review of, 242
Fisher, W. C., "The Relation of the Individual Practitioner to Free Dental Services" (correspondence), 660
on tartar solvent, 568
Fistulas, new method of diagnosing dead teeth causing, 935
Fitz-Hugh, J. C. G., "Cast Gold Inlay with Porcelain Face" (clinic), 235
Flanagan, A. J., on social forces in the dentist's life, 357
on the care of the teeth of children, 1024
on the dentist and the law, 470
Fletcherism and some of its effects on nutrition, 752
R. E. Luther on, 556
Flick, Lawrence F., "Tuberculosis: Preventive Measures for the Dentist and His *Clientèle*," 1332
Flies in dental offices, 1414
Flint, W. D., on some fallacies in orthodontia, 227
Florida Board of Examiners, 626
Florida State Dental Society, announcement, 719
Flour dust producing dental disease in bakers, 937
Food, value of the teeth in the digestion of, A. Michel on, 1272
Food and Drugs Act of June 30, 1906, L. F. Kebler on, 304
Foodstuffs, chemical changes of, during digestion, A. W. Doubleday on, 285
Formaldehyd, H. B. Holmes on, 1219
and tricresol in dental therapeutics, 107
Formalin and adrenalin chlorid in the treatment of hypersensitive dentin, 118
Formamint, 243
disinfection of the oral cavity with, 248
Formocresol, action of, H. R. Raper on, 559
Formula, secret, preparations in the practice of dentistry, J. P. Buckley on, 429
Forsyth Dental Dispensary for Children (editorial), 598
Foster, J. H., on oral hygiene, 1120
Fracture of lower jaw, simple splint for, 118
Fractures, of the mandible, casting aluminum splints for, 1415
of the maxillæ, treatment of, J. M. Murphy on, 981
France, dentistry in, N. S. Jenkins on, 1327
Free dental dispensary service, W. W. Belcher on, 444
Free dental services, relation of the individual practitioner to, W. C. Fisher on (correspondence), 660
Freeman, Solomon, death of, 706

Frenum labii superioris, surgical operation of the, T. G. Bradford on, 986
Friedrichs, A. G., on oral hygiene, 1107
Friesell, H. E., "A Gnatho-dynamometer" (clinic), 578
"An Original Casting Device of the Igorots" (clinic), 578
"Ideal Contact Point" (clinic), 578
Function of the teeth in the development of the face, C. A. Hawley on, 1053
Fundenberg, W. H., on the application of successful business principles in dental practice, 219
Fused teeth, one case of, and one of gemination, 372
Fusible metal, a, 1043

Gallie, Don M., on the gold inlay, 1367
Galvano-cautery for sterilizing root-canals, 251
Gangrenous roots, formula for treatment of, H. C. Register on, 976
Gartrell, J., on tartar solvent, 568
Gases, compressed antiseptic, application of, to operative dentistry, 737
in putrescent conditions, H. B. Holmes on, 1219
Gastro-intestinal diseases, defective teeth and, 702
Gaylord, E. S., on the conditions of success, 1286
Geisinger, John W., death of, 253
Gemination, case of, and one of fused teeth, 372
Georgetown University, Dental Department, commencement of, 823
George Washington University, Dental Department, commencement of, 945
Georgia State Dental Society, announcement, 513
Germany, dentistry in, N. S. Jenkins on, 1327
Gillett, H. W., on oral prophylaxis as a special field of work in dentistry, 917
on sectional inlays, 1288
Gilbert, J. O., death of, 706
Gingivitis, hot water in chronic or aggravated, J. O. Hall on, 1086
in diabetes, 1164
in pregnant women, treatment of, 1172
interstitial, 1303
massage in, 1041
Girdwood, J., "Odd Cases," 535
Glasgo, E. G., death of, 504
Glassblowers, oral diseases in, 937
Glass spatula for artificial enamel, W. A. Heckard on, 894
Glass stoppers, removing of, from bottles, 501
Gnatho-dynamometer, a, H. E. Friesell on, 578
Goble, L. S., on cast gold inlays, 366
on free dental dispensary service, 476
Godon, Chas., address at unveiling of the Horace Wells monument, 674
Gold, how to overcome the brittleness of, in casting, 608
in contact with tooth tissues, adventitious effect of large masses of, I. N. Broomell on, 389
in inlay work, C. S. Van Horn on, 881
methods of controlling the contraction of, W. A. Price on, 1017
soldering of, and the causes of checking of soldered porcelain facings, 696
Gold and other dentures, practical hints for the making of, 107
Gold and platinum *vs.* German silver in orthodontia appliances, 701
Gold cast inlays, removing wax model and pins together in, 703
Gold crown, anatomically correct, to make, 811
Gold dummies, hollow seamless, an original method of casting, 704
Gold filling, non-cohesive, 609
relative merits of the cast and the malleted, D. H. Squire on, 57
S. G. Perry on, 1209
Gold filling and gold inlay, 695
Gold fillings, final finishing of, 1416
simplified, 246
Gold foil filling, its virtues and drawbacks, J. V. Conzett on, 1337
Gold inlay, "butt" joint contra-indicated in, 1345
contra-indications against, 1340
convenience form of cavity preparation for, 1344
indications for, 1340
making the wax model for, 1345
outline, form of cavity preparation for, 1341
preparation of cavo-surface angle and margins, 1344
principle of cavity preparation for, 1340
resistance form of cavity preparation for, 1343
retentive form of cavity preparation for, 1343
thoughts of the, 317
Gold inlays, 363
an original method for casting, 246
causes of failures in, S. G. Perry on, 1209
hydraulic cement for setting, D. M. Gallie on, 1370
setting, 810
J. V. Conzett on, 1339
H. M. Davidson on, 1260
Gold insets, 744
Gold plate, usable, from gold filings, 939
Gold shell bicuspid crown with Steele facing, 1312
Gold solder, 377
Gorgas, H. F., on tartar solvent, 568
Gorman, J. A., on orthodontia, 989
on relation of diseases of the nose and pharynx to dentistry, 1113
Grady, R., on what medicine and dentistry need, 565
Graf, August, death of, 1050
Gray, B. Frank, on orthodontia and orthopedia of the face, and the influence of expansion of the dental arches in establishing normal respiration, 1363
Gray, G. W., death of, 1050
Gray, J. P., obituary of, 1313
on oral hygiene, 1106
on relation of diseases of the nose and pharynx to dentistry, 1115
on the porcelain inlay, 1252
on treatment of fractures of the maxillæ, 992
Green, Frank, death of, 253
Gregg, G. T., "The Relief of Pain During Dental Operations," 293
Grenache, Claude A., death of, 1315
Griffis, W. M., "The State Association's Part in the Oral Hygiene Propaganda," 1105
Grinding inaccurately fitting dentures, A. Gysi on, 416
Grippe, spontaneous death of the pulp without caries due to, 1309
Guerini, V. (Italy), greeting to F. D. I., 779
Guilford, S. H., on deficient development of dental arches and necessity of early treatment, 1247
Gum denture, continuous, 252
Gum massage, E. S. Talbot on, 652
Gum sections, grinding, 1313
Gums, burning of, under a gold plate, 937

Gutta-percha as an insoluble seal for margins of inlays, 250
instrument for setting crowns with, 1418
J. P. Buckley on, 433
Gutta-percha fillings in children's teeth, H. L. Wheeler on, 145, 147
Guttmann, G., "Technique of Urinalysis," review of, 492
G. V. Black Dental Club of St. Paul, 128, 1318
Gysi, A., "The Problem of Articulation," 1, 148, 268, 403

Hall Ernest L., obituary of, 125
Hall, J. O., "Hot Water in Dentistry," 1082
Hall, Perry E., death of, 1419
Hands, cleansing of, 1335
"Hard" and "soft" teeth, 1307
Hardening of articles or instruments of rubber, how to prevent, 117
Hare-lip and cleft palate, surgical management of complicated, 494
Harris, Andrew J., death of, 706
Harrod, J. M., death of, 706
Hart, Philip S., death of, 1050
Hartford Dental Society, memorial to Dr. Horace H. Hayden, 946
Harvard Dental Alumni Association, 948
Harvard University Dental School, commencement of, 946
Hawaii Board of Examiners, 131, 839
Hawley, C. A., "Auxiliary Arch for Root-Movement" (clinic), 587
"Charts for Determining the Arch and Measuring Instrument" (clinic), 587
"Device for Obviating Ligation of Bicuspids" (clinic), 587
"Function of the Teeth in the Development of the Face," 1053
"Split Buccal Tube for Keeping Molars from Tipping" (clinic), 587
on diagnosis of adenoid growths in children, 570
on drugs and the dental profession, 342
Head, J., "Enamel Softening and Rehardening as a Factor in Erosion," 46
"Tartar Solvent" (clinic), 567
on the chemical and physical characteristics of porcelain, 84
Heckard, W. A., on the relief of pain during dental operations, 327
Heckman, John D., death of, 706
Hemophiliacs, prevention of hemorrhage in, 500
Hemorrhage, after extirpation of the pulp, 1170
collapse from, 1310
Hemostasis without medication, 608
Hemostat, some uses of, in dentistry, J. P. Corley on, 586
Henthorn, W. H., on oral hygiene, 1109
Herpes buccalis, H. S. Vaughan on, 567
Hert, B. S., on the relative merits of the cast and the malleted gold filling, 91
Hertz, J. C., on the treatment of children's teeth, 224
High-pressure anesthesia, points in, 809
Hinman, T. P., on the use of the Jackson regulating appliances, 1365
Hirschfeld, Wm., on the treatment of devitalized teeth, 793
Histological investigation of the apex of the root after treatment of the root-canal, results of, 604
Hoag, Wm. E., on the relief of pain during dental operations, 334
Hobson, V. H., death of, 706
Hoff, N. S., on modern oral hygiene, 71
Hofheinz, R. H., on enamel softening and rehardening as a factor in erosion, 80
on report of Committee on Dental Practice (Dental Society of the State of New York), 1006
on saliva, plaque formation, and dental caries, 1148
on sectional inlays, 1291
on the progress of dental science and art, 1390
on the relative merits of the cast and the malleted gold filling, 92
Holland, dentistry in, N. S. Jenkins on, 1331
Holmes, B. H., "Practical Dental Therapeutics," 1217
on operative dentistry, 1257
Hornung, Geo. J., death of, 380
Hot-air therapy, contribution to, 934
Hot water in dentistry, J. O. Hall on, 1082
Houck, John C., death of, 253
Howard University, Dental Department, commencement of, 822
Howe, P. R., "Dietetics," 441
Hungary, dentistry in, M. L. Rhein on, 1396
Hunt, S. M., death of, 380
Hurd, A. W., on insanity due to painless dental disease, 592
Hutchinson, R. G., on the relief of pain during dental operations, 336
"What Constitutes a Cure of Pyorrhea Alveolaris, and How May It be Accomplished?" 1126
Hyatt, L. S., death of, 1050
Hyatt, T. P., on the practical application of oral hygiene to the school curriculum, 906
on the report of Committee on Practice (Dental Society of the State of New York), 1006
Hydrochloric acid poisoning as manifested in the oral cavity, 937
Hydrogen dioxid, L. F. Kebler on, 308
Hydrogen sulfid gas, action of, on corrosive sublimate, 1414
Hygiene, dental, Francis Jean on, 678
in regard to public health, E. C. Kirk on, 969
of the mouth, 811
oral, and American dental schools, E. S. Talbot on, 647
oral, and public school dental education of Pennsylvania, report of committee on, 1378
oral, and tuberculosis, 1172
oral, commission on (F. D. I.), 596
oral, in Alabama, F. A. Johnston on, 66
oral, inauguration of the present movement, J. P. Corley on, 1117
oral, iodo-glycerol in, E. S. Talbot on, 652
oral, report of committee on (National Dental Association, Southern Branch), 1103
oral—the oral cavity of maternity nurses a dangerous source of infection for their patients, 1165
oral, the practical application of, to the school curriculum, P. G. White on, 863
oral, J. J. Sarrazin on, 541
public dental, A. Lenhardtson on, 1351
public oral, P. G. White on, 37
Hygiene Council, Dental, of the Dental Society of the State of New York, report of, 1151
Hygiene Exhibition, International (editorial), 1300
Hygiene propaganda, oral, the state association's part in, W. M. Griffis on, 1105
Hygienic and normal buccal cavity, the proper use of, and its effect on the health and nutrition of the body, R. E. Luther on, 551

Hygienist, a modern: dentistry past and present, as seen by, L. C. Taylor on, 42
Hypersensitive dentin, "amberline" (Dr. Flagg) for reducing, also for retarding caries, 120
Hypersensitive teeth, nitrous oxid and oxygen as an aid in the painless preparation of cavities in, C. E. Peters on (clinic), 235
Hypoplasia of teeth and tuberculosis, 1041

Ibbotson, Edward B., obituary of, 1178
Ideal crown for anterior teeth, 379
Identification of criminals by the teeth, 501
Igorots, an original casting device of the, H. E. Friesell on, 578
Illinois Board of Examiners, 515, 1182
Illinois Civil Service Commission, 259
Illinois State Dental Society, announcement, 256, 838
Impacted and erupting third molars, hot water in inflammatory conditions of, J. O. Hall on, 1084
Impacted third molar, Ludwig's angina due to, H. McIntosh on, 1092
removal of, 1416
Implantation of teeth, experiments in, 802
technique of, F. W. Allen on, 576
Impression for artificial denture, value of rinsing the mouth with cold water before taking an, 809
plaster, of partial cases, taking, J. H. McClenahan on, 580
Impressions, a new method for taking, J. F. Lief on, 502
for inlays, taking, W. A. Price on, 1020
plaster, 372
Impression trays, how to remove hardened modeling compound from, 501
keeping clean, C. V. Campbell on, 503
Incisal angles, restoration of, with compound fillings of gold and porcelain, W. A. Price on, 1023
Incisal edge, preparation of cavities involving the, 1173
Indexing, systematic, and classification of dental literature and its possible results, A. D. Black on, 629
Indiana Board of Examiners, 131, 626
Indiana Dental College, commencement of, 826
Indiana State Dental Association, announcement, 257
Infected alveoli, H. S. Vaughan on, 656
Infection, tuberculous, mode of, L. F. Flick on, 1332
Inflammation, oral, treatment of, 1043
Influenza, sinusitis in complication with, 938
Inlay, cast gold, with porcelain face, J. C. G. Fitz-Hugh on (clinic), 235
for an occlusal cavity in molars, making an, W. A. Price on, 1018
gold, J. V. Conzett on, 1339
gold, A. Owre on, 317
hollow, making a wax model for, 610
porcelain, a plea for, L. P. Robertson on, 1250
porcelain, influence of cement upon the color of a, 1311
the cast gold, A. H. Merritt on, 1000
the porcelain and the gold, S. G. Perry on, 1204
Inlay and filling, gold, 695
Inlays, a good sprue wire for, 117
as abutments, 119
cast gold, anchorage in, 1044
cast gold, removing wax model and pins together in, 703
cast gold, with pins, 1170
Inlays, cast hollow gold, repair of perforated gold crown with, 1037
cast, in combination with porcelain facings, some odd cases of, J. Girdwood on, 535
fitting to place, 249
gold, an original method for casting, 246
gold, causes of failures in, S. G. Perry on, 1209
gold, cavity preparation for, H. M. Davidson on, 1260
gold, for approximal cavities, faced with Jenkins' porcelain, W. W. Booth on (clinic), 234
gold, in bicuspids, W. A. Price on, 1022
gold, in incisors and canines, W. A. Price on, 1022
gold, setting, 810
gold, J. H. Beebee on, 363
gutta-percha as an insoluble seal for margins of, 250
hand instruments in cavity preparation for, 1171
individual, *versus* abutment, 1415
porcelain, controlling shrinkage in, 1042
porcelain, matrix preparation for, 809
porcelain, retention of, 1171
porcelain, to prevent excessive brilliancy in, 1171
sectional, S. G. Perry on, 1204
taking impressions for, W. A. Price on, 1020
the cement question in, C. S. Van Horn on, 878
wax impressions for, removing without distortion, 608
Inlay work, casting rings for, W. A. Heckard on, 894
nomenclature of, C. S. Van Horn on, 881
porcelain, shade guide in, 1174
Insanity caused by painless dental disease, H. S. Upson on, 526
Insanity and nervousness caused by painless dental disease, 251
Instruction, dental, Francis Jean on, 677
Instrument-making, dental, J. A. Watling on, 584
Instruments, correct use of, J. E. Storey on, 1255
old, to impart a brilliant black color to, 1042
the dentist's, a possible source of tuberculous infection, L. F. Flick on, 1333
washing and sterilization of, 1334
Insulating cement, 608
International Dental Federation, meeting of Executive Council, 782
meeting of Commission on Education, 790
meeting of Commission on Hygiene, 787
proceedings of Paris meeting, 663, 772
International Hygiene Exhibition (editorial), 1300
International Memorial to Willoughby D. Miller (editorial), 368
Interne, dental, to be appointed at Bellevue Hospital, H. L. Wheeler on (correspondence), 1230
Interproximal space, restoration of, 610, 938, 1020
Interproximal spaces and contours in filling operations, W. A. Price on, 1015
Intestine, bacterial action in the, A. W. Doubleday on, 291
large, absorption of food in the, A. W. Doubleday on, 289
small, absorption of food in the, A. W. Doubleday on the, 288
small, bacterial action in the, A. W. Doubleday on, 290
Investment materials, uniformly good, for casting, 1043
W. A. Price on, 1017

Investment, waste, wax carving pencils made of, 1045
Iodin as an astringent, antiseptic, disinfectant, and germicide in mouth diseases, 803
and calcium hypochlorite in abnormal discoloration of the teeth, 374
tincture of, to avoid irritation from, 1172
Iodoform-creasote as a caustic in deciduous teeth, 1038
Iodo-glycerol in oral hygiene, E. S. Talbot on, 652
Iowa Board of Examiners, 132, 625
Iowa State Dental Society, announcement, 131, 511
Irby, J. S., address of welcome from the city of Denver (National Dental Association), 1093
Irregularities, in the growth of teeth and jaws, effects of chronic nasal obstruction during childhood upon, 1173
Italy, dentistry in: the "Istituto Stomatologico Italiano" (correspondence), 759
dentistry in, N. S. Jenkins on, 1330
the barring of the D.D.S. in, A. Augusto on (correspondence), 325

Jackson, Victor H., "Orthodontia and Orthopedia of the Face, and the Influence of Expansion of the Dental Arches in Establishing Normal Respiration," 1253
Jackson, crib, construction of, C. L. Constantini on, 588
Jackson regulating appliances, M. F. Finley on, 586
Jackson system of orthodontia, C. W. B. Wheeler on (clinic), 233
Jackson, W. H., "Gold Insets," 744
Jackson, W. Heman, obituary of, 125
Jacobs, John M., death of, 1419
Jarvie, W., on ethics, 209
on the conditions of success, 1286
Jaw, advancing the, in cleft-palate cases, 117
deformities of, associated with malocclusion of the teeth, surgical treatment of, 108
lower, osteomyelitis of the, 110
lower, simple splint for fracture of, 118
Jaw-absorption, excessive, difficult cases of, 1046
Jean, Francis, address at unveiling of the Horace Wells monument at Paris, 675
address at opening session of the F. D. I. meeting at Paris, 676
Jenkins, N. S., "The Progress of Dental Science and Art," 1321
accepting Fellowship Medal of the Dental Society of the State of New York, 1298
address at unveiling of the Horace Wells monument, 674
on a bridge with an all-porcelain base, 794
on report of Committee on Practice (New York State Dental Society), 1011
Jessen, E. (Germany), greeting to F. D. I., 776
address as president of Commission on Hygiene (F. D. I.), 788
Jewett, Henry R., obituary of, 122
tribute to the memory of, by alumni of Atlanta Dental College, 122
Johnston, C. B., death of, 1419
Johnston, F. A., "Oral Hygiene in Alabama," 66
Jones, A., on the proper use of a normal and hygienic buccal cavity, 589
Jones, B., on surgical operation of the frenum labii superioris, 993
on treatment of fractures of the maxillæ, 991
Jones, Thomas J., obituary of, 125
Journalism, dental: the prospective journal of the National Dental Association, A. Owre on, 642

Kansas Board of Dental Examiners, 723
Kansas City Dental College, commencement of, 708
Kansas State Dental Association, announcement, 384
Kauffer, H. J., on sectional inlays, 1294
Kebler, L. F., "Drugs and the Dental Profession," 303
Keefe, Dennis F., obituary of, 379
in memoriam resolutions on, 504
Keirstead, C. R., death of, 1179
Kelsey, H. E., "The Duty of the General Practitioner Toward Cases of Orthodontia which Occur in His Practice," 1087
on diagnosis of adenoid growths in children, 571
on orthodontia simplified, 577
Kemery, C. L., "All-Gold Cast Crown" (clinic), 234
Kentucky State Dental Association, announcement, 384
Ketcham, A. H., "Are the 'New School Orthodontists' Practicing Excessive Expansion?" 955
on expansion of the dental arches as an aid in establishing normal occlusion, 1361
Kirk, E. C., "A Consideration of the Question of Susceptibility and Immunity to Dental Caries," 729
"Dental Service as a Public Health Measure," 969
"Report of Committee on President's Address" (National Dental Association), 1231
"The Question of Medical Education for the Dentist," 34, 928
greeting (from United States) to the F. D. I., 777
on ethics, 208
Klump, G. W., on the treatment of children's teeth, 221
Knepper, Germanus, obituary of, 124
Koser, A. S., "Methods and Appliances in Plate Work" (clinic), 234
Kritchewsky, Dr., on ammonium fluorid in the treatment of pyorrhea, 793

Lactic ferment in oral therapeutics, 606
Lactic ferment medication, secondary caries from, 694
Lake Erie (Pa.) Dental Association, announcement, 384
Lakin, S. W., death of, 127
Law, the dentist and the, J. I. Devlin on, 309
Leach, W. A., death of, 127
Lead poisoning, as manifested in the oral cavity, 936
Leary, T., "Pyorrhea Alveolaris from a Bacterial Standpoint," 52
Lebanon Valley (Pa.) Dental Association, announcement, 619
LeCron, D. O. M., dinner in honor of, 385
on the bleaching of porcelain fillings, 1238
Lee, A. P., "Report of Committee on Dental Science and Literature" (Pennsylvania State Dental Society), 1376
Lenhardtson, A., "Public Dental Hygiene: an Address to the Dental Profession of America," 1351
greeting from (Sweden) to F. D. I., 779
Lepkowski's new root-canal treatment with sodium subchlorid and caustic soda, 692
Lett, Isidore, "Diseased Roots and Devitalized Teeth," 194
"Surgical Dressings in Oral Operations," 323
"Unique Alveolar Abscesses," 750

Leucoplakia, dangers of, 812
local treatment of, 1417
Lief, J. F., "A New Method for Taking Impressions," 502
Ligation of bicuspids, device for obviating, C. A. Hawley on, 587
Ligatures, wire, how to make tight, 1171
Limber, Wm. M., death of, 253
Lime-water as a mouth-wash, 117
Lincoln Dental College, commencement of, 822
Liquor antisepticus, J. P. Buckley on, 437
Literature, dental, W. D. De Long on, 1383
dental, A. P. Lee on, 1376
systematic indexing and classification of, and its possible results, A. D. Black on, 629
Lodge, E. B., "Solid Gold Molar Crown for a Badly Broken-down Root" (clinic), 235
Logan crown, broken, simple method of repairing, 1171
Loomis, Wm. H., obituary of, 123
Loose teeth, the Bing crown as a splint for, F. W. Allen on, 576
Louisiana State Dental Society, announcement, 257
Louisville College of Dentistry, commencement of, 817
Low, F. W., on dental caries, 482
on enamel softening and rehardening as a factor in erosion, 81
on insanity due to painless dental disease, 593
on the relative merits of the cast and the malleted gold filling, 94
on tumors, 362
Lowry, T. A., death of, 253
Lubben, H. W., on relation of diseases of the nose and pharynx to dentistry, 1114
Ludwig's angina, a suspected case of, H. R. Sparrevohn on, 645
due to impacted third molar, H. McIntosh on, 1092
Lukins' retention appliance, J. M. Murphy on, 983
Lusk, L. L., death of, 1178
Luther, R. E., "The Proper Use of a Normal and Hygienic Buccal Cavity, and Its Effect on the Health and Nutrition of the Body," 551
on dental caries, 482
on tumors, 361
Luzerne and Lackawanna Dental Society, announcement, 386

McCall, J. O., "A Reply to Dr. Summa" (correspondence), 562
"Report of the Dental Hygiene Council" (Dental Society of the State of New York), 1150
on the proper use of a normal and hygienic buccal cavity, 590
on the relative merits of the cast and the malleted gold filling, 95
McCarthy, P. J., on social forces in the dentist's life, 359
McCauley, C. M., "Oxyphosphate Cements," 1225
on operative dentistry, 1257
McClenahan, J. H., "Taking Plaster Impressions of Partial Cases" (clinic), 580
McClenahan, J. T., "Address of Welcome" (Maryland State Dental Association and District of Columbia Dental Society), 341
McCready, W. A., "Small Set of Office Rolls" (clinic), 233
McCullough, P. B., on the question of medical education for the dentist, 100
on the treatment of children's teeth, 224
McGill University, Dental Department, commencement of, 825
McIntosh, H., "Dental Skiagraphy," 418
"Ludwig's Angina Due to Impacted Third Molar" (correspondence), 1092
McKay, F. S., on deficient development of dental arches and necessity for early treatment, 1246
McManus, H., on social forces in the dentist's life, 357
on true art in dental prosthesis, 1124
McManus, J., on the dentist and the law, 472
Macdonald, R., "A Proposed Application of Compressed Antiseptic Gases to Operative Dentistry," 737
Machat, Bertram B., "Facial Neuralgia," 1335
Magnalium in dental technics, 373
Maine Board of Examiners, 627
Maine Dental Society, announcement, 385, 563, 721
Major, G. R., death of, 1315
Malformation of the dental arches, causes for, J. L. Young on, 1189
Malleted gold filling and the cast, relative merits of, D. H. Squire on, 57
"Malocclusion of the Teeth (Treatment of)," by E. H. Angle, German edition, review of, 600
Malocclusion, due to faulty eruption, J. L. Young on, 1191
etiology of, J. L. Young, 1187
extraction for correction of, always contraindicated, A. H. Ketcham on, 964
necessity of early treatment of, J. L. Young on, 1195
of the teeth, extreme, report of a case of, with description of the measures taken for its relief, 698
surgical treatment of certain deformities of the jaw associated with, 108
treatment of, J. L. Young on, 1197
Maloney, James H., obituary of, 1418
Malposed and supernumerary teeth, H. S. Vaughan on, 656
Mandible, removal of adamantinoma (cystoma) of the, 113
resection and exarticulation of, contribution to the simplification and a uniform method of, the prosthetic treatment of, 373
silver wire after resection of portion of, 376
Mandibular fractures, casting aluminum splints for, 1415
Manila, dental clinics in: schools, prison, hospital, and orphanage, L. Ottofy on, 887
Mansfield, Frederick J., death of, 1419
Manufacturers and dealers, dental, gifts from, in aid of charitable dental services, W. W. Belcher on, 447
Marler, W. A., death of, 127
Marple, James, death of, 706
Marquette University, Dental Department, announcement, 131, 1422; commencement, 818
Maryland Board of Examiners, 514, 1183
Maryland State Dental Association and District of Columbia Dental Society, announcement, 512
proceedings of, 339, 563, 721
Massachusetts Board of Registration, 260, 625, 1182
Massachusetts State Dental Society, announcement, 257, 720
Massage of the gingivæ and gums, 1040
of the gums, E. S. Talbot on, 652
vibratory, in dentistry, 1408
vibratory, W. H. Mitchell on, 575
Massage paste in pyorrhea alveolaris, W. O. Talbot on, 854

Masselink, B. H., "The Advent of Painless Dentistry," 868
Masticating efficiency different on the two sides of the jaws, a case of, due to ill-advised extraction, A. H. Ketcham on, 964
Mastication, importance of, in children, J. L. Young on, 1190
influence of, on the teeth, R. E. Luther on, 554
mechanical importance of, R. E. Luther on, 552
proper, analysis of the feces for determination of, A. Michel on, 1273
Masticatory bones and muscles, anatomy and nutrition of the, R. E. Luther on, 553
Masticatory groove of the molars, A. Gysi on, 268
Maternity nurses, the oral cavity of, a dangerous source of infection for their patients, 1165
Mathers, J. H., death of, 253
Matrix, copper, in inserting amalgam fillings, 702
Matrix formation for simple approximal cavities, 1173
Maxilla, dressing after removal of, 249
indications for expansion of the, 121
Maxillary sinusitis, 1311
Mayrhofer's balsam of Peru treatment for putrescent pulps, W. A. Dean on, 1263
Mead, Wm. B., "in memoriam" resolutions, 1050
Meaker, S. R., on cast gold inlays, 367
on free dental dispensary service, 478
Measuring instruments and charts for determining the arch, C. A. Hawley on, 587
Mechanical formation of the teeth, A. Gysi on, 282
Mechanics, dental, as a problem in the curriculum (editorial), 1032
Medical College of Virginia, Dental Department, commencement of, 815
Medical education for the dentist, the question of, E. C. Kirk on, 34
Medical or dental education for the dentist, question of, 928
Medical *vs.* dental education (editorial), 928
Medicine and dentistry, what they need, F. W. Stiff on, 563
Medico-Chirurgical College, Dental Department, commencement of, 823
Meetings at Denver, The, 614
Meetings, The Paris (editorial), 596
Meharry Dental College, commencement of, 707
Meisburger, L., on cast gold inlays, 367
on report of Committee on Practice (Dental Society of the State of New York), 1003
on tumors, 361
Menopause, H. S. Vaughan on, 657
Merchant, M. S., on operative dentistry, 1257
on relation of diseases of nose and pharynx to dentistry, 1114
Mercury, a brush for collecting, 1414
Mercury-silver, A. Fenchel on, 23
Mercury-tin, A. Fenchel on, 25
Mercury poisoning as manifested in the oral cavity, 936
Mermillod, Chas., death of, 706
Merritt, A. H., on enamel softening and rehardening as a factor in erosion, 78
on the practical application of oral hygiene to the school curriculum, 904
Mershon, J. V., on some fallacies in orthodontia, 226
Mess, C. J., "Dental Bookkeeping" (clinic), 584
Metabolism, the processes of, and sensitivity in hard tooth-substances, investigation on, 110
Metal, a fusible, 1043
Metallic stains, treatment of, 1043
Metals, contraction and expansion of, W. A. Price on, 1016
Metcalf, John T., death of, 127
Meyer, L. A., on tartar solvent, 567
Michaelis, Wm. E., death of, 1178
Michel, A., "The Value of the Teeth in the Digestion of Food," 1272
on action of pancreatic secretion on starch, 1272
Michigan Board of Dental Examiners, 386, 724, 1183
Michigan State Dental Society, announcement, 513
Micro-organisms of the deposit upon the teeth, a plea for further investigation of; pleomorphism and the pleomorphists, T. Von Beust on, 658
Mierley, C. V., "Manipulation of the Oxyhydrogen Blowpipe" (clinic), 235
Miller, A. L., "Practical Porcelain Fillings" (clinic), 580
Miller, Ezekial, death of, 706
Miller memorial, American, B. L. Thorpe on, 1098
Miller memorial, the F. D. I., T. W. Brophy on, 1102
B. L. Thorpe on, 1098
Miller prize, international award of, to Dr. G. V. Black, 598, 784
Miller, W. B., "Pyorrhea Pen for Applying Medicaments in Pyorrhea Pockets," 233
Miller, Willoughby D., International Memorial to (editorial), 368
Millikin, J. D., "Pulp Diagnosis by the Induced Current Employed by Dr. Marshall Nearly Twenty Years Ago" (correspondence), 326
Mills, G. A., on ethics, 216
on the practical application of oral hygiene in the school curriculum, 908
on the question of susceptibility and immunity to dental caries, 769
Mills, W. A., on dentigerous cysts, 348
on diagnosis of adenoid growths in children, 571
on drugs and the dental profession, 343
Mimmack, A. E., on cast gold inlays, 367
Minnesota Board of Dental Examiners, 260, 625, 1183
Mississippi Dental Association, announcement, 131
Mississippi Dental Examiners, 624
Missouri State Dental Association, announcement, 511
Mitchell, W. H., "Flexible Lower Denture" (clinic), 575
"Vibratory Massage" (clinic), 575
Modeling compound, hardened, how to remove from impression trays, 501
Models in orthodontia, necessity of a collection of, 1044
Molar clamp band, 809
Molar, impacted third, removal of, 1416
third, Ludwig's angina due to an impacted, H. McIntosh on, 1092
Molars, masticatory grooves of, A. Gysi on, 268
third, erupting and impacted, hot water in inflammatory conditions of, J. O. Hall on, 1084
third, operative injuries in extraction of, 247
Money and Some Other Things, Concerning (editorial), 236
Montana Board of Examiners, 726
Montana State Dental Society, announcement, 620
Moody, Joseph D., obituary of, 123
Morgan, G., on operative dentistry, 1258

Mosbey, Barney A., death of, 1178
Mother-of-pearl dust, as producing dental disease in turners, 937
Mouth-breathing, 805
Mouth, congenital deformity of, 812
hygiene of, 811
syphilitic mucous patches in, differential diagnosis of, from other mouth-infections, 808
Mouth diseases, iodin as an astringent, antiseptic, disinfectant, and germicide in, 803
Mouth Disorders and the Death-rate (editorial), 1159
Mouth-props in anesthetizing patients with V-shaped maxillæ, 1415
Mouth-wash, a, E. S. Talbot on, 652
in pyorrhea alveolaris, J. J. Sarrazin on, 544
lime-water as a, 117
phenol as a, 1313
Mouth-washes, 378, 436
in pyorrhea alveolaris, J. P. Buckley on, 861
the problem of, 1411
Moving teeth outward bodily, device for, V. H. Jackson on, 1359
Mucin, influence of, on bacterial growth and plaque formation, W. J. Gies on, 1144
in relation to the bacterial plaque in dental caries, 735
Mucosa, buccal, pigmentation of, in anemia, 1310
Mucous patches, syphilitic, differential diagnosis of, 808
Mummery, J. H. (Great Britain), greeting to the F. D. I., 777
Murlless, F. T., Jr., on the care of the teeth of children, 1029
Murphy, J. M., "Treatment of Fractures of the Maxillæ," 981
Murray, Wm. S., death of, 1050
Myers, S. M., on relation of diseases of the nose and pharynx to dentistry, 1114
on treatment of fractures of the maxillæ, 992

Nall, U. C., death of, 253
Narial openings, indications for increasing, 1357
Nasal obstruction, chronic, during childhood; its effects upon the growth of teeth and jaws, 1045, 1173
Nasal stenosis, 1357
Nash, B. C., on cast gold inlays, 366
on oral prophylaxis as a special field of work in dentistry, 923
Nathan, Edward E., death of, 706
National Association of Dental Examiners, announcement, 128
National Association of Dental Faculties, announcement, 509
National Dental Association, thirteenth annual meeting, proceedings of Section III, 65
National Dental Association, fourteenth annual meeting, announcements of Publicity Committee, 614, 712, 829
officers for 1910-11, 1421
organization of, 381
program of, 715
proceedings of general sessions, 1093, 1231
proceedings of Section I, 1241, 1361
proceedings of Section II, 1367
National Dental Association, prospective journal of, A. Owre on, 642
National Dental Association, Southern Branch, and Texas State Dental Association, announcement, 129, 509
proceedings of, 988, 1103, 1250
National Institute of Dental Pedagogics, 1422
Natural teeth, positions of, A. Gysi on, 413
Neale, H. C., "Hollow Metal Cast Crowns" (clinic), 235
Nearing, L. A., death of, 706
Nebraska Dental Board, 515, 1318
Necrosis, extensive, report of a case of alveolar abscess with, J. M. Walker on, 176
phosphor-, L. Arnone on, 424
Needham, C. W., "Address of Welcome" (Maryland State Dental Association and District of Columbia Dental Society), 339
Nervousness and insanity caused by painless dental disease, 251
Netherlands—New Dental Society, 129
Neuman, W. C., death of, 1050
Neuralgia and pericementitis, J. P. Buckley on, 435
Neuralgia, facial, aconitin in, 1169
facial, co-operation of physician and dentist required in treatment of, 1339
facial, diagnosis by radiography, 1336
facial, importance of correct diagnosis, 1336
facial, local causes of, 1336
facial, operative treatment, with report of cases, 1336
facial, B. B. Machat on, 1335
trifacial, 114
trifacial, seventy-five cases of, treated by deep injections of alcohol, 244
trigeminal, and neuralgia of more definite etiology, H. S. Vaughan on, 654
trigeminal, due to dental lesions, diagnosis of, T. W. Brophy on, 950
trigeminal, treatment of, 244
Neuralgic pains due to pyorrhea alveolaris, tannic acid for, 117
New Hampshire and Vermont Dental Societies, announcement, 131
New Hampshire Board of Registration, 259, 724, 1183
New Jersey Board of Registration, 259, 726, 1184
New Jersey State Dental Society, announcement, 513
New Mexico Dental Society, announcement, 722
New Orleans College of Dentistry, commencement of, 944
Newton, Wm. J., obituary of, 1177
New York Alumni Association, Xi Psi Phi Fraternity, announcement, 509
New York College of Dentistry, commencement of, 824
New York Odontological Society, proceedings of, 327, 894
New York State Dental Society, announcement, 619
proceedings of, 78, 999
Nicholson, G. C., "The Need of a Code of Dental Ethics," 321
Ninth District (N. Y.) Dental Society, announcement, 623
Nitrate of silver spots, to remove, 1040, 1310
Nitrous oxid and oxygen, 295
as an aid in the painless preparation of cavities in hypersensitive teeth, C. E. Peters on (clinic), 235
Nomenclature of pyorrhea alveolaris, J. J. Sarrazin on, 550
Non-eruption of teeth, syndrome from, 810
Norman, John W., death of, 127
North Carolina Board of Examiners, 516
North Carolina State Dental Society, announcement, 385, 722
North Dakota Dental Association, announcement, 620
Northeastern Dental Association, proceedings of, 350, 469
announcement, 1051

Northern Illinois Dental Society, announcement, 1179
Northern Indiana Dental Society, 1179
Northern Ohio Dental Association, announcement, 512
North Pacific Dental College, commencement of, 822
North Philadelphia Association of Dental Surgeons, announcement, 1181
Northwest Missouri Dental Club, organization of, 257
Northwestern University, Dental Department, commencement of, 942
Nose and pharynx, relation of diseases of, to dentistry, H. A. Engelhardt on, 1073
Novocain, and its applications in dentistry, 1169
in local anesthesia, 605
B. H. Masselink on, 870
Nutrition and health of the body, effect on, of Fletcherism, 752
effect on, of the proper use of a normal and hygienic buccal cavity, R. E. Luther on, 551
Nyce, J. E., "Silex as a Separator" (clinic), 579

Obstruction, chronic nasal, effect of, during childhood, upon the growth of the teeth and jaws, 1045
Occlusion, dental, anomalies of, and orthodontia, L. Subirana on (bibliography), 601
O'Connor, C. H., death of, 1050
Occupation, dental diseases in various, 955
Ocular diseases, oral prophylaxis as a means of prevention of, 745
Odontographic Society of West Philadelphia, announcement, 258, 509, 1317
Odontological Society of Chicago, announcement, 131
Odontological Society of New Orleans, announcement, 258
Odontological Society of Western Pennsylvania, announcement, 383
Odontological Society *vs.* the College of Dentists, N. S. Jenkins on, 1324
Office, dental, cleanliness in, J. M. Weems on, 1268
Ohio College of Dental Surgery, commencement of, 815
Ohio State Dental Board, announcement, 627
Ohio State Dental Society (Miller Memorial Committee), 624
program for annual meeting, 1422
Oils, essential, L. F. Kebler on, 306
Old and New Dental Journals (bibliography), 691
Oleaginous and aqueous solutions in the therapy of caries, 606
Ontario and Canadian Dental Associations, announcement, 511
Operative dentistry, proposed application of compressed antiseptic gases in, 737
some things in, J. E. Storey on, 1255
Opportunity, professional, C. C. Allen on, 1079
Opsonic therapy (vaccine treatment), in pyorrhea alveolaris, 701
Oral cavity, syphilitic and cancerous manifestations of, 1409
the cleaning of the, 746
Oral hygiene, report of committee on (N. D. A.), 65
Oral prophylaxis, as a means to prevent ocular diseases, 745
duty of, as shared by dentist and physician, 749
significance of, 748
Orange wood points, a porte-polisher for holding, 1045
Organization of dentistry, early, A. Owre on, 638
Orthodontia, an exact science, 1354
anomalies of dental occlusion and, L. Subirana on (bibliography), 601
cases of, duty of the general practitioner in, H. E. Kelsey on, 1087
clinics on, 586
deficient development of the arches of the deciduous teeth and the necessity of early treatment, J. L. Young on, 1185
ethics and, S. G. Perry on, 140
function of the teeth in development of the face, C. A. Hawley on, 1053
how to cement bands, especially in retention appliances, 1171
necessity of a collection of models in, 1044
requirements for the study of, E. A. Bogue on, 1223
retaining appliances in, 1045
separation preliminary to applying clamp bands in, 1173
significance of respiration in, 1164
simplified, R. L. Simpson on, 577
some fallacies in, G. F. Bowman on, 191
the Jackson system of, C. W. B. Wheeler on (clinic), 233
use of a "record card" in, 1355
P. A. Skeen on, 989
Orthodontia and orthopedia of the face, 1353
Orthodontia appliances, gold and platinum *vs.* German silver in, 701
Orthodontic treatment, facial results from, C. A. Hawley on, 1061
number of visits necessary in, 1172
principles of, A. H. Ketcham on, 968
Orthodontists, the new school, are they practicing excessive expansion, A. H. Ketcham on, 955
Osburn, Craven T., death of, 253
Osburn, R. C., "The Effects of Brachycephaly and Dolichocephaly on the Teeth of Man," 517
Osmotic pressure of some local anesthetics, investigations on, 605
Osteitis, alveolar, 1303
(pyorrhea alveolaris), the vaccine treatment of, 497
Osteomyelitis, of the jaws, question of the preservation of the teeth in, 1309
of the lower jaw, 110
Otalgia of dental origin, H. S. Vaughan on, 657
Ottofy, L., "Dental Clinics in Manila: Schools, Prison, Hospital, and Orphanage," 887
Ottolengui, R., on ethics, 213
on large masses of gold in contact with tooth tissue, adventitious effects of, 462
on systematic indexing of dental literature, 682
on the gold inlay, 1373
Our Frontispiece (editorial), 689
Outline form of cavity preparation for gold inlays, J. V. Conzett on, 1341
Owen, Frank B., death of, 1419
Owre, A., "A Timely Thought or Two," 637
"Thoughts on the Gold Inlay," 317
Oxygen and nitrous oxid, 295
Oxyhydrogen blowpipe, manipulation of, C. V. Mierley on (clinic), 234
Oxyphosphate cement and amalgam fillings, 700
in children's teeth, H. L. Wheeler on, 145
Oxyphosphate cements, C. M. McCauley on, 1225

Pain, after extraction, 250
relief of, during dental operations, 293
Painless dental disease, insanity caused by, H. S. Upson on, 526

Painless dentistry, the advent of, B. H. Masselink on, 868
Palatal malformation, regulation of, 795
Palate, hard, asymmetry of, 1311
Palmer, G. B., on the stone model method in making gold and porcelain restorations, 1024
Palmer, James G., death of, 706
Pancreatic secretion, action of, on starch, 1270
Paradental cysts, treatment of, by cauterization with creasote, 499
Paraffin in gasoline as a separating fluid, 808
Paraform in the treatment of sensitive dentin, 118
Paris Meetings, The (editorial), 596
Partial cases, taking plaster impressions of, J. H. McClenahan on, 580
Partnership, professional, ethics in, S. G. Perry on, 142
Passe, J. G., on ethics, 217
Patents relating to dentistry, monthly record of, 132, 260, 388, 516, 628, 728, 840, 948, 1052, 1184, 1320, 1424
Paterson, W. B., president's address at F. D. I. meeting at Paris, 772
Patient and practitioner, reciprocal ethical relationship between, S. G. Perry on, 137
Patients, receiving new, S. G. Perry on, 141
referring to specialists, S. G. Perry on, 140
Patterson, J. D., on modern oral hygiene, 73
Payne, E. Treat, death of, 706
Pearson, W. H., "Immediate Extirpation of the Pulp" (clinic), 575
Pease, J. G., on ethics, 217
Penal institutions, dental service in, W. W. Belcher on, 455
Pendulum, the Swing of the (editorial), 1405
Pennsylvania Board of Examiners, 626, 1319
Pennsylvania State Dental Society, announcement, 257
proceedings of forty-first annual meeting, 217
proceedings of forty-second annual meeting, 1376
Perdew, E. J., death of, 1315
Perfect teeth preserved to a great age, 1047
Perhydrol in dental therapeutics, 247
Pericementitis, hematogenic calcic, W. O. Talbot on, 851
phagedenic, W. O. Talbot on, 851
ptyalogenic calcic, W. O. Talbot on, 851
serious cases of, accompanied by suppuration, local and general treatment in, 1413
subacute, H. S. Vaughan on, 657
Pericementitis and neuralgia, J. P. Buckley on, 435
Periodonitis, chronic general, 1303
Permanent teeth, mode of eruption of, J. L. Young on, 1190
Perry, S. G., "Ethics," 133
on conditions of success, 1282
on systematic indexing of dental literature, 684
"Sectional Inlays," 1204
Peters, C. E., "Nitrous Oxid and Oxygen as an Aid in the Painless Preparation of Cavities in Hypersensitive Teeth" (clinic), 235
Pharynx and nose, diseases of, relation of to dentistry, H. A. Engelhardt on, 1073
Phelps, W. C., on tumors, 360
Phenol as a dental disinfectant and mouth-wash, 1313
Phenol-sulfonic acid, cauterization with, in stubborn cases of pyorrhea alveolaris, J. P. Buckley on, 861
J. P. Buckley on, 434
Philadelphia Dental College (Temple University), commencement of, 824
Philanthropy, Commercial (editorial), 486
Phosphor-necrosis, L. Arnone on, 424
Phosphorous poisoning as manifested in the oral cavity, 936
Pigmentation of the buccal mucosa in anemia, 1310
Pin and tube tooth combined on a bicuspid with diverging root-canals, application of the casting process in a, 493
Pivot teeth after dental trauma, 933
Pivot tooth, a collarless, 1036
Plaque, bacterial, experimental production of the, 737
Plaque formation and dental caries, W. J. Gies on, 1141
in relation to saliva, investigations on, L. M. Waugh on, 170
Plaster, to harden, 249
Plaster and plaster impressions, 372
Plaster cast, methods of hardening, J. Schembs on, 940
Plaster impressions of partial cases, taking, J. H. McClenahan on, 580
Plate, gold, burning of the gums under, 937
gold, wiring and re-swaging, 939
Plates, cast aluminum, 812
preparation of the mouth for, by mastication, 1041
pure aluminum, points in casting, 809
rubber, fractured, quick method of repairing, 120
rubber, how to bring out with a smooth surface on both sides, 500
upper, refitting, 1172
Plate work, advantages of the Snow bow in, E. E. Belford on, 577
methods and appliances in, A. S. Koser on (clinic), 234
Platinum base for full denture, 608
Pleomorphism and the pleomorphists: a plea for further investigation of the micro-organisms of the deposits upon the teeth, T. von Beust on, 658
Poisoning, arsenical, in pulp-devitalization, 500
Poisonous dyes producing oral disease, 937
Poisons that produce dental disease in various occupations, 935
Polishing, method of holding a crown while, 937
Polishing metals, 249
Polishing silicate cement fillings, 1416
Poor, the dentist and the, W. W. Belcher on, 444
Porcelain, chemical and physical characteristics of, and their relation to its manipulation, W. L. Fickes on, 48
Porcelain and gold inlays, S. G. Perry on, 1204
Porcelain crown work, 705
Porcelain crowns, all-, setting, 120
method of making fit perfectly, 1415
on bicuspids and molars, reinforcing the lingual cusp in, E. E. Cruzen on, 584
Porcelain face, cast gold inlay with, J. C. G. Fitz-Hugh on (clinic), 235
Porcelain facings, soldered, causes of checking, and the soldering of gold, 696
Porcelain fillings, practical, A. L. Miller on, 580
the bleaching of, L. E. Custer on, 1221
Porcelain inlays, a plea for, L. P. Robertson on, 1250
controlling shrinkage in, 1042
influence of cement upon the color of, 1311
matrix preparation for, 809
retention of, 1171
to prevent excessive brilliancy in, 1171
Porcelain inlay work, shade guide in, 1174
Porcelain teeth, a method of coloring, 796

Porcelain work, some odd cases of, W. A. Capon on, 581
J. Girdwood on, 535
A. S. Wolfe on, 581
Porte-polisher for holding orange-wood points, 1045
Porter, R., "Wax Models for Gold Castings" (clinic), 235
on cast gold inlays, 366
Porter, Van Alex, death of, 1419
Portuondo, R. H., the treatment of dead teeth, 793
Potassium cyanid, dangers of, 1171
Potassium iodid for removing silver nitrate spots, 1040
Potassium sulfocyanate, in retarding plaque formation, W. J. Gies on, 1141
discovery of, in the saliva, 1347
effects of, as to dental caries, 1347
ferric chlorid test to determine the presence of, 1348
in the saliva, R. W. Bunting on, 1346
necessity of test for, with ether solutions, 1350
quantity of, in the saliva, 1347
physiological action of, in the saliva, 1347
salivary examination for, 119
source of, in the saliva, 1347
Power, J. E., "President's Address" (Northeastern Dental Association), 351
Practice, dental, application of successful business principles to, E. G. Ebersole on, 181
Praise, a word of, for the F. D. N. (editorial), 801
Pregnancy, treatment of oral disease during, 1306
Pregnant women, treatment of gingivitis in, 1172
Preparations, secret formula, in the practice of dentistry, is it necessary to use? J. P. Buckley on, 429
Price, W. A., "Some Advantages of the Stone Model Method in Making Gold and Porcelain Restorations," 1015
on the care of the teeth of children, 1028
Pringle, G. W., on dental caries, 483
Prinz, H., "Dental Materia Medica and Therapeutics" (bibliography), 240
Prinz's Dental Materia Media, W. A. Dean on, 1263
Processes, exposed, euroform paste for abraded surfaces and, J. P. Buckley on, 434, 1264
Professional opportunity, C. C. Allen on, 1079
Prognathism, lower, correct setting-up of artificial teeth in, 114
Progress of dental science and art, N. S. Jenkins on, 1321
Prophylactic treatment of pyorrhea alveolaris, J. J. Sarrazin on, 549
Prophylaxis movement, the oral, W. A. Dean on, 1262
Prophylaxis, oral, as a special field of work in dentistry, E. B. Spalding on, 909
of the oral mucosa, 1415
E. C. Blaisdell on, 575
Prosthetics, dental, true art in, N. S. Essig on, 1066
Prosthetic pieces, cleaning with sulfurous acid, 934
preparation of the mouth for, by massage, 1040
Prosthetic treatment, of resection and exarticulation of the mandible, contribution to the simplification and uniform method of the, 373
of two cases of pyorrhea, 1166
Prosthetic work in the dispensary, W. W. Belcher on, 451
Protein foods and fats, functions of the saliva in relation to, A. W. Doubleday on, 286
Protruding upper incisors and retreating chin, a case of, A. H. Ketcham on, 961
Psi Omega Fraternity, announcement, 509
Publications, recent dental, W. A. Dean on, 1263
Public, dental education of the, 738
Public health measure, dental service as a, E. C. Kirk on, 969
Public school children in New South Wales, condition of the teeth of, 755
Public school dental clinic movement, 694
Public school dental education and oral hygiene, P. G. White on, 37
Public Service (The) Dentistry and (editorial), 103
Pullen, H. A., on deficient development of dental arches and necessity of early treatment, 1241
Pullman, Dr., on action of pancreatic secretion on starch, 1271
Pulp, arsenous acid *versus* arsenic acid in devitalizing, 1171
devitalization of, in deciduous teeth, by creasote-iodoform, 1038
devitalized, treatment of, before removing, 1264
hemorrhage after extirpation of, 1170
immediate extirpation of, W. H. Pearson on, 575
importance of preservation of, 250
putrescent, dressing for, 1264
putrescent, Mayrhofer's balsam of Peru treatment for, W. A. Dean on, 1263
putrescent, treatment of, by rational therapeutics, H. B. Holmes on, 1218
spontaneous death of, without caries, due to grippe, 1309
Pulp diagnosis by the induced current employed by Dr. Marshall nearly twenty years ago, J. D. Millikin on (correspondence), 326
Pulpitis, contribution to the therapy of, devitalization of the pulp with codrenin, 802
Pulpless roots, formula for treatment of, H. C. Register on, 976
Pulp-nodules, H. S. Vaughan on, 656
Pulp residues in the conservative treatment of the teeth, treatment of, 1165
Pulps, putrescent, and abscessed roots, J. P. Buckley on, 430
removal of, 609
removing from abutment teeth, H. C. Register on, 975
Pus in the mouth and its consequences, 747
Putnam, Dr., on insanity due to painless dental disease, 593
Putrescent pulps and abscessed roots, J. P. Buckley on, 430
treatment of, by rational therapeutics, H. B. Holmes on, 1218
Pyocyanase, 243
in dentistry, 806
Pyorrhea alveolaris (alveolar osteitis), vaccine treatment of, 497
amputation of roots, in treatment of, W. O. Talbot on, 854
bridge work in, 855
clinical experience and observation in the treatment of, 851
constitutional treatment of, 119
dermatol for, 609
description and treatment of, 1303
diagnosis of, 852
diagnosis and treatment of, J. J. Sarrazin on, 540
extraction in, 854

Pyorrhea alveolaris from a bacterial standpoint, T. Leary on, 52
gum massage in, 854, 1040
mechanical treatment of, J. P. Buckley on, 862
medical treatment of, J. P. Buckley on, 860
opsonic therapy (vaccine treatment) in, 701
pericementitis and, local and general treatment of serious cases of, 1413
prosthetic treatment of two cases of, 1166
removal of pulps in, 854
sensitiveness of devitalized teeth in, 701
some observations on the bacteriology of, and treatment of the disease by bacterial vaccines, 495
splints in, 855
sulfurous acid in the treatment of, 934
surgical treatment of, J. P. Buckley on, 858
systematic method of treatment, R. G. Hutchinson on, 1129
systemic treatment of, J. P. Buckley on, 861
tannic acid for neuralgic pains due to, 117
true, and its symptoms, J. P. Buckley on, 856
true, practical treatment of, J. P. Buckley on, 856
vaccine treatment of, 497
what constitutes a cure of, and how may it be accomplished? R. G. Hutchinson on, 1126
A. H. Merritt on, 1001
Pyorrhea astringent, a, J. P. Buckley on, 435
Pyorrhea pen for applying medicaments in pyorrhea pockets, W. B. Miller on (clinic), 233
Pyrozone and sodium dioxid, bleaching teeth with, 701
Pyrozone for discolored teeth, 933

Quest for the causes of susceptibility and immunity to dental caries, 730
Quincerot, M., address at the unveiling of the Horace Wells monument, 670
Quinin for producing local anesthesia, 1413
Quinin and urea hydrochlorate as a local anesthetic, 1310

Radash, H. E., "A Compend of Histology" (bibliography), 491
Radiography, diagnosis of facial neuralgia by, B. B. Machat on, 1336
Ranula, T. W. Brophy on, 954
Raper, H. R., "The Action of Formocresol," 559
Reading (Pa.) Dental Society, announcement, 257
Réal, M., demonstration of vacuum machine for casting plates with porcelain teeth, 795
Record card in orthodontia, work, V. H. Jackson on, 1353
Record models in prosthetics, N. S. Essig on, 1069
Reduction and retention of fractures, means of, J. M. Murphy on, 982
Referring patients to specialists, S. G. Perry on, 140
Reflex pain, difficulty of diagnosis in, T. W. Brophy on, 949
Register, H. C., "The Physico-Prosthetic Crown and Bridge with Reference to Fundamentals," 973
Regulating, different forms of anchorage in, 811
simultaneous use of expansion arch and clamp bands in, 1310
Regulating appliances, Jackson's, analogy of, with the human body, 1354
Jackson's, M. F. Finley on, 586
Regulating extremely constricted upper dentures by stationary anchorage, 808
Removing a wax model for a gold inlay from the cavity without distortion, 1046
Replantation in pyorrhea alveolaris, J. P. Buckley on, 861
Repolishing artificial teeth after grinding, 117
Requirements, dental *vs.* medical, 501
preliminary, for the dental student of the future, A. Owre on, 640
Resection, of portion of mandible, silver wire after, 376
of the apex: failures in surgical root-treatment and their causes, 1163
Resection and exarticulation of the mandible, contribution to the simplification and uniform method of the prosthetic treatment of, 373
Resistance form of cavity preparation for gold inlays, J. V. Conzett on, 1343
Respiration as affecting the position of the teeth, significance of, 1164
normal, influence of expansion of the dental arches in establishing, 1353
Resorption of the deciduous and eruption of the permanent teeth, microscopic investigations on, 115
Retaining appliances, how to cement bands in, 1171
in orthodontia, 1045
Retention and reduction of fractures, means of, J. M. Murphy on, 982
Retentive form of cavity preparation for gold inlays, J. V. Conzett on, 1343
Retruding upper incisors with complications, a case of, A. H. Ketcham on, 962
Reynolds, F. M., death of, 1315
Rhachitic changes in the dentin, 805
Rhachitis diagnosed by dentinal changes, 805
Rhein, M. L., on large masses of gold in contact with tooth tissue, adventitious effects of, 463
on modern oral hygiene, 72
on oral prophylaxis as a special field of work in dentistry, 918
on pyorrhea alveolaris, 1136
on report of Committee on Practice (New York State Dental Society), 1010
on systematic indexing of dental literature, 684
on the gold inlay, 1374
on the practical application of oral hygiene to the school curriculum, 905
on the progress of dental science and art, 1395
on the relief of pain during dental operations, 334
Rhinoscopy and palpation, diagnosis by means of, H. A. Engelhardt on, 1076
Rhode Island Board of Registration, 627, 1320
Rice, J. T., "Strengthening a Root for a Davis Crown" (clinic), 583
Rich, A. C., on pyorrhea alveolaris, 1132
Rich, John B., obituary of, 1176
Richmond crown, a base for a, 1044
Riggs' disease, J. J. Sarrazin on, 539
Rip Van Winkles in American dental college faculties, E. S. Talbot on, 298
Roach attachments, missing teeth supplied by, J. A. Boarts on (clinic), 234
Robertson, L. P., "A Plea for the Porcelain Inlay," 1250
on dental fads, 1254
on oral hygiene, 1105
on relation of diseases of the nose and pharynx to dentistry, 1115

Robertson, L. P., on surgical operation of the frenum labii superioris, 994
on treatment of fractures of the maxillæ, 993
Robinson, R. D., on the use of the Jackson regulating appliances, 1365
Robinson, Thomas, death of, 127
Roe, W. J., on measures to protect the dentist and his *clientèle* from tuberculosis, 1387
Rohland, C. B., obituary of, 1049
"in memoriam" resolutions, 1049
Rolls, office, small set of, W. A. McCready on (clinic), 233
Root, closing of the perforated apex of, with subsequent filling of the root-canal by a new method, 375
Root-apex, results of histological investigations of, after-treatment of the root-canal, 604
Root-canals, diverging, on a bicuspid, application of the casting process in a combined pin and tube tooth, 493
Root-canal filling, proper, importance of, H. B. Holmes on, 1220
J. P. Buckley on, 432
Root-canal treatment with sodium subchlorid and caustic soda, Lepkowski's new, 692
Root-canals, galvano-cautery for sterilizing, 251
lubricating, how to make chloro-percha for, 700
Root-cysts, dental, pathogenesis of, 112
Root-movement, auxiliary arch in, C. A. Hawley on, 587
Roots, abscessed, and putrescent pulps, J. P. Buckley on, 430
diseased, and devitalized teeth, I. Lett on, 194
Root-treatment (resection of the apex), surgical failures in, and their causes, 1163
Rosenthal, E. (Belgium), greeting to F. D. I., 777
Rotterdam Dental Society, prizes offered by, 255
Roy, Morris, brief *résumé* of F. D. I. meeting by, 663
Royal College of Dental Surgeons of Ontario, commencement of, 707
Royal Society of Medicine, the, 1326
Rubber and celluloid, solvents for, 1415
Rubber articles or instruments, preventing the hardening of, 117
Rubber dam in difficult cases, 250
necessity for, in preparing cavities for inlays, J. F. Wallace on, 1372
prevention of leakage in, 501
removal of, after filling operations, 1414
Rubber-dam holder, preventing from marking the patient's face, 1310
Rubber dentures, quick repair of, 378
Rubber plates, cleaning with sulfurous acid, 934
fractured, quick method of repairing, 120
how to bring out with a smooth surface on both sides, 500
Rubber repairs, a short cut in, 1311
Rupert, J. A., "Simple and Accurate Method of Taking the Bite and Assembling a Bridge" (clinic), 234
Rust, how to prevent, 1171

Sachs, I., on the anchorage of bridges in inlays, 793
St. Louis Dental College, commencement of, 821
St. Louis Society of Dental Science, announcement, 258
Saliva, acidity of, a solution for, E. S. Talbot on, 652
as an etiological factor, 1346
characteristic reaction of, in dental arthritis, 1440
Saliva, diacetic acid in, the question of, 1350
functions of, in relation to proteid foods and fat, A. W. Doubleday on, 286
human, plaque formation, and dental caries, W. J. Gies on, 1144
investigation on plaque formation and dental caries in relation to, L. M. Waugh on, 170
potassium sulfocyanate in, 1346
reaction of, in relation to susceptibility and immunity to dental caries, 733
significance of the sulfocyanates in, 1167
the physiological function of (Correspondent's report, Dental Society of the State of New York), 1270
Saliva and carbohydrates, A. W. Doubleday on, 286
Salivary analysis, technique of, H. C. Ferris on, 1236
Salivary examination for potassium sulfocyanate, 119
Salts, inorganic, the chief, in the liquids of the body, A. W. Doubleday on, 292
Salvas, J. C., on the treatment of children's teeth, 223
Sandpaper disks, hints for using, 1416
Sarcoma and carcinoma, T. W. Brophy on, 954
Sarrazin, J. J., "Riggs' Disease," 539
Sarsaparilla, L. F. Kebler on, 305
Satterlee, F. W., death of, 504
Saunders, A. D., death of, 1179
Sawyer, A. J., death of, 1050
Scalers, dentate (Kirk), use of, F. W. Allen on, 576
Scaling necks and roots of teeth, J. J. Sarrazin on, 542, 546
Scandinavia, dentistry in, N. S. Jenkins on, 1331
Schamberg, M. I., on oral prophylaxis as a special field of work in dentistry, 921
on the relief of pain during dental operations, 330
Schembs, J., "Method of Hardening Plaster Casts," 940
Schlegel, G. S., "Report of Committee on Oral Hygiene and Public School Dental Education in Pennsylvania" (Pennsylvania State Dental Society), 1378
on the treatment of children's teeth, 222
School children, London, dental treatment of, 1163
School curriculum, the practical application of oral hygiene to, P. G. White on, 863
School inspection, dental, J. D. Towner on, 1112
Schools, American dental, oral hygiene and, E. S. Talbot on, 647
Second District (N. Y.) Dental Society, announcement, 1421
Secret formula preparations in the practice of dentistry: is it necessary to use, J. P. Buckley on, 429
Seibert, E. G., "Diagnosis of Adenoid Growths in Children" (clinic), 570
Seip, H. S., on the question of medical education for the dentist, 99
Senna, L. F. Kebler on, 306
Sensitive dentin, paraform in the treatment of, 118
Sensitive tooth, gold crown for bridge abutment on a, 1311
Sensitivity, after devitalization of the pulp, treatment of, 1165
in hard tooth substances, investigations on the anatomic conditions for the processes of metabolism and, 110
Separating fluid, paraffin in gasoline as a, 808
Separating teeth for inlay work, C. S. Van Horn on, 880

Separation, preliminary to applying clamp bands in orthodontia, 1173
Separator, silex as a, J. E. Nyce on, 579
Separators, S. G. Perry on, 1210
Sepsis, oral, and tetanus, 249
Setting-up, the correct, of artificial teeth in lower prognathism, 114
Seventh and Eighth District Dental Societies of the State of New York, announcement, 1318
proceedings of, 360, 476
Shade guide in porcelain inlay work, 1174
Shade of an artificial tooth, to determine, 937
Sharp, C. H., on tumors, 362
Sharp, J. G., "A New Era in Dental Educational Standards," 1211
"President's Address" (Dental Faculties Association of American Universities), 1399
Sharpening files, 118
Shell crown, method of repairing, 608
Shrinkage in casting, C. S. Van Horn on, 873
in porcelain inlays, controlling, 1042
neutralization and compensation of, C. S. Van Horn on, 877
Siffre, Dr. (France), greeting to the F. D. I., 779
Silex as a separator, J. E. Nyce on, 579
Silicate cement fillings, polishing of, 1416
Silicate cements, A. H. Merritt on, 1000
Silver-mercury, A. Fenchel on, 23
Silver nitrate, pure carbolic acid *vs.*, in open ulcers about the mouth, 1417
Silver nitrate spots, to remove, 1040, 1310
Silver-tin alloys, constitution of pure, A. Fenchel on, 20
Simpson, R. L., "Orthodontia Simplified" (clinic), 577
Sinuses of the jaw and chronic alveolar abscess, successful treatment of, 699
Sinusitis in complication with influenza, 938
maxillary, 1311
Skeen, P. A., "Orthodontia," 989
on the "new school orthodontists" and excessive expansion, 998
Skiagraphy, a sterilizable film-holder for, 1036
dental, H. McIntosh on, 418
Smart, W. C., on surgical operation of the frenum labii superioris, 994
Smith, B. Holly, response to addresses of welcome (National Dental Association), 1095
Smith, E. H., "Report of Educational Committee" (Dental Faculties Association of American Universities), 1401
Smith, Edward J., obituary of, 126
Smith, F. M., on extension for prevention, 1297
Smith, F. W., death of, 253
Smith, H. C., on action of pancreatic secretion on starch, 1270
Smith, J., on dental fads, 1254
on the porcelain inlay, 1252
Smith, J. H., death of, 1050
Smokers' artificial teeth, painting, 1171
Snow bow, advantages of, in plate work, E. E. Belford on, 577
Soaps, antiseptic value of, 1170
Social forces in the dentist's life, J. E. Power on, 351
Sockets of the teeth, progressive destruction of; chronic general periodontitis (pyorrhea alveolaris) alveolar osteitis, interstitial gingivitis, 1303
Sodium dioxid for discolored teeth, 932
method of ascertaining the purity of, 932
Sodium subchlorid and caustic soda, Lepkowski's new root-canal treatment with, 692
Softening and erosion, superficial, at the junction of the enamel and cementum, method of treating, 1175
Solbrig, Oscar, on the preservation of the sulci of newly erupted first and second molars by the application of copper oxyphosphate, 795
demonstration of a new material for making models, 795
Solder, gold, 377
Solders, 364
Soldering aluminum, 1175
Soldering fluid and soldering agent substitute, 609
Soldering of gold and the causes of checking of soldered porcelain faces, 696
Soldering paste, 608
Solutions, aqueous and oleaginous, in the therapy of caries, 606
South Carolina Board of Examiners, 627
South Carolina State Dental Society, 622
South Dakota Board of Examiners, 131, 627, 1424
South Dakota State Dental Society, announcement, 621
Southern California Dental Association, announcement, 512
Southern Dental College, commencement of, 709
Southern Illinois Dental Society, announcement, 1051
Southern Minnesota Dental Society, announcement, 383
Southern Wisconsin Dental Association, announcement, 622
Southwest Michigan Dental Society, announcement, 383
Southwestern Nebraska Dental Society, announcement, 383, 1318
Spain, dentistry in, N. S. Jenkins on, 1328
Spalding, E. B., "Oral Prophylaxis as a Special Field of Work in Dentistry," 909
Sparrevohn, H. R., "A Suspected Case of Ludwig's Angina," 645
Spatula, glass, for artificial enamel, W. A. Heckard on, 894
Spaulding, J. H., on cavity filled with gold and tin foil, 794
Specialists, referring patients to, S. G. Perry on, 140
Specialization, ethics as influenced by, 139
Specializing in dentistry, W. A. Spencer on, 1091
Speech, regulating the, A. Gysi on, 416
Spencer, W. A., "Twentieth Century Dentistry," 1089
Splint, interdental, a new, 109
simple, for fracture of lower jaw, 118
Splints, aluminum, for fractures of the mandible, casting, 1415
in pyorrhea alveolaris, W. O. Talbot on, 855
Sprue wire, a good, for inlays, 117
Sputum cup a necessary substitute for the spittoon, 1334
Squire, D. H., "The Relative Merits of the Cast and the Malleted Gold Filling," 57
Staining teeth, J. Girdwood on, 538
Stains, metallic, treatment of, 1043
removal of, from teeth, 699, 933
silver nitrate, to remove, 1040, 1310
Stanley, N. A., on social forces in the dentist's life, 357
on the chemical changes of foodstuffs during digestion, 359
Staples, G. S., "A Warning Against Dental Fads," 1253
on operative dentistry, 1257
Staples, G. W., on orthodontia, 990
Starbuck, Wm. C., death of, 707
Starling-Ohio Medical College, commencement of, 710

Starr, A. R., on adventitious effects of large masses of gold in contact with tooth tissue, 467
on the progress of dental science and art, 1393
on the question of susceptibility and immunity to dental caries, 769
State board examinations, W. D. De Long on, 1383
State Dental College, Texas, commencement of, 943
State University of Iowa, Alumni Dental Association, reunion of, 383
College of Dentistry, commencement of, 825
Stationary anchorages, regulating extremely constricted upper dentures by, 811
Stebbins, R. O., death of, 1050
Steel, corrosion of, caused by paper, 1313
Steele facing, gold shell bicuspid crown with, 1312
Stein, J. B., on adventitious effects of large masses of gold in contact with tooth tissue, 461
on the question of susceptibility and immunity to dental caries, 766
Stenosis, nasal, V. H. Jackson on, 1357
Sterile solutions, simple device for preventing contamination of, 1312
Sterilization and washing of instruments, L. F. Flick on, 1334
of aqueous solutions of chlorhydrate of cocain, 938
Sterilizing root-canals, galvano-cautery for, 251
Stewart, H. T., on pyorrhea alveolaris, 1266
Stiff, F. W., "What Dentistry and Medicine Need," 563
Stockton, C. S., on ethics, 212
Stomach, absorption of food in, A. W. Doubleday on, 287
Stomatitis, mercurial, massage in, 1041
Stomatological Symposium, The (editorial), 928
"Stomatology" and Dentistry (editorial), 928
Stone model method, some advantages in, in making gold and porcelain restorations, W. A. Price on, 1015
Storey, J. E., "Some Things in Operative Dentistry," 1255
on oral hygiene, 1110
Stout, Geo. C., on tuberculosis; preventive measures for the dentist and his *clientèle*, 1384
Straight, Milton B., obituary of, 940
Strang, C. W., on the dentist and the law, 470
Strayer, Frederick A., death of, 1178
Strong, Dr., on the coloring of porcelain teeth, 796
Sturgis, Thomas, death of, 380
Subirana, L. M., "Anomalies of Dental Occlusion and Orthodontia," French edition (bibliography), 601
Success, the conditions of, J. L. Williams on, 1200
Suction chamber, cast upper metal denture with, 604
Suction plate for lower denture, 703
Sulfocyanate, potassium, salivary examination for, 119
Sulfocyanates in human saliva, significance of, 1167
Sulfurous acid (H_2SO_3) in dentistry, application of, 934
Sullivan, A. A., death of, 1178
Summa, R., "The Educational Campaign" (correspondence), 205
a reply to, by J. O. McCall (correspondence), 562
Supernumerary and malposed teeth, H. S. Vaughan on, 656
Suppuration, chronic, of maxillary antrum, 377
Susceptibility, relative, of different teeth to dental caries, some experiments on, 1306
Susceptibility and immunity to dental caries, consideration of the question of, E. C. Kirk on, 729
Susquehanna (Pa.) Dental Association, announcement, 510
proceedings of, 99
Sutherland, Ozora P., death of, 1419
Swift, A. L., on large masses of gold in contact with tooth tissue, adventitious effects of, 460
on oral prophylaxis as a special field of work in dentistry, 915
on pyorrhea alveolaris, 1134
on systematic indexing of dental literature, 682
Swing of the Pendulum, The (editorial), 1405
Switzerland, dentistry in, N. S. Jenkins on, 1329
Syndrome from non-eruption of teeth, 810
Syphilitic and cancerous manifestations in the oral cavity, 1409
Syphilitic mucous patches, differential diagnosis of, from other affections of the mouth, 808

Taking impressions, new method for, 502
Talbot, E. S., "Clinical Experience and Observations in the Treatment of Pyorrhea Alveolaris," 851
"Oral Hygiene and American Dental Schools," 647
"Rip Van Winkles in American Dental College Faculties," 298
on enamel softening and rehardening as a factor in erosion, 79
on pyorrhea alveolaris from a bacterial standpoint, 95
Talbot and the medical *ignis fatuus*, C. M. Wright on (correspondence), 661
Talbot's criticism of modern orthodontia, A. H. Ketcham on, 955
Talbot, W. O., clinical experience and observations in the treatment of pyorrhea, 851
on surgical operation of the frenum labii superioris, 994
Tannic acid for neuralgic pains due to pyorrhea alveolaris, 117
"Tartar solvent," some experiences with, F. H. Bowman on, 63
J. H. Head on, 569
J. J. Sarrazin on, 545, 548
Taylor, Levi C., "Dentistry, Past and Present, as Seen by a Modern Hygienist," 42
on the care of the teeth of children, 1027
Taylor, Lucy B., obituary of, 1315
Teeth, chemical and mechanical abrasion of, 804
device for moving outward bodily, 1359
discoloration of, contribution to the pathogenic study of, 1412
of public school children in New South Wales, 755
syndrome from non-eruption of, 810
Teeth and alveolar processes as points of entrance for the tubercle bacillus, 1412
Temporary stopping, a precaution in inserting, 1310
Tennessee State Dental Association, announcement, 619
Teradontograph, the, L. Subirana on, 601
Tetanus, from infection of tooth-cavity, 808
oral sepsis and, 249
Texas Board of Examiners, 387, 725, 1423
Texas Dental College, commencement of, 818

Texas State Dental Association and National Dental Association, Southern Branch, announcement of union meeting, 129, 509
Therapeutics, dental, perhydrol in, 247
practical dental, H. B. Holmes on, 1317
Thermo-cautery, practical method of, 252
Thielen, B. F., on oxyphosphate cements, 1265
on relation of diseases of the nose and pharynx to dentistry, 1115
on the porcelain inlay, 1252
Thiersch, W., demonstration of the usefulness of gold inlays in dental prosthesis, 796
Third molars, massage in tardy eruption of, 1041
painful eruption of, general treatment of, and for all cases of acute alveolar abscess, 1043
Thomas, A., address at unveiling of the Horace Wells monument, 676
Thompson, A. H., "The Psychology of the Tool-using Faculty," 882
Thorpe, B. L., "In Memory of Dr. James Young Crawford," 995
President's address (National Dental Association), 1097
Tin-mercury, A. Fenchel on, 25
Tin-silver alloys, pure, constitution of, A. Fenchel on, 20
Tipping of molars, sustaining bar to prevent, V. H. Jackson on, 1360
of molars, split buccal tubes to prevent, C. A. Hawley on, 587
Todd, Wm. H., obituary of, 1047
Tongue, carcinoma of the, 1038
Tonsillectomy, painless and bloodless, with descriptive technique, 938
Tool-using faculty, psychology of, A. H. Thompson on, 882
Tooth, implantation of, experiments on, 802
Toothache, temporary relief of, 249
Tooth-brushes, E. S. Talbot on, 648
Tooth-pastes in pyorrhea alveolaris, J. P. Buckley on, 861
Tooth-powder, E. S. Talbot on, 653
Totten, Emory, death of, 1050
Towner, J. D., on operative dentistry, 1258
on oral hygiene, 1112
Training, preliminary, general tendency of European dentistry as to, N. S. Jenkins on, 1331
Trauma, dental, pivot teeth after, 933
Treat, Benj. F., death of, 706
Tricresol and formaldehyd in dental therapeutics, 107
Trifacial neuralgia, 114
seventy-five cases of, treated by deep injections of alcohol, 244
Trigeminal neuralgia, and neuralgias of more definite etiology, H. S. Vaughan on, 654
treatment of, 244
Truman dinner, the, announcement, 130
Tube and pin tooth combined on a bicuspid with diverging root-canals, application of the casting process in a, 943
Tubercle bacillus, teeth and alveolar processes as points of entrance for, 1412
Tuberculosis and dental erosion, 1041
Tuberculosis, oral hygiene and, 1172
preventive measures for the dentist and his *clientèle*, 1332
Tuberculosis problem, relation of modern dentistry to, 1411
Tuberculous infection, mode of, 1332
Tufts Dental College School, commencement of, 944
Tumors, oral, T. W. Brophy on, 953
M. Clinton on, 314
Turner, P. S., on operative dentistry, 1259
Ulcers, open, about the mouth, pure carbolic acid *vs.* silver nitrate in, 1417
University College of Medicine, Dental Department, commencement of, 819
University of Buffalo, Department of Dentistry, commencement of, 822
University of California, College of Dentistry, announcement, 619, 1317
commencement of, 819
University of Illinois, College of Dentistry, announcement, 385, 722
commencement of, 943
University of Maryland, Dental Department, commencement of, 820
University of Memphis, College of Dental Surgery, commencement of, 817
University of Michigan, Dental Department, commencement of, 945
University of Minnesota, College of Dentistry, commencement of, 826
University of Pennsylvania, School of Dentistry, commencement of, 816
University of Pittsburg, School of Dentistry, commencement of, 944
University of Southern California, Dental Department, commencement of, 943
Upson, H. S., "Insanity Caused by Painless Dental Disease," 526
Urea hydrochlorate and quinin as a local anesthetic, 1310
Urinalysis, technique of, W. A. Dean on, 1264
Utah Board of Examiners, 1320
Vaccine treatment of pyorrhea alveolaris (alveolar osteitis), 497
Vaccines, bacterial, treatment of pyorrhea alveolaris by, and some observations on the bacteriology of the disease, 495
Vallee, A. R., death of, 253
Vanderbilt University, Department of Dentistry, commencement of, 709
Van der Hoeven, Dr. (Holland), greeting to F. D. I., 778
Van Horn, C. S., "A Crown, Useful at Times," 438
"Casting: a Review and Commentary, Including a Technique which Makes Possible a Casting of the Same Size as the Wax Pattern at Body Temperature," 873
Van Woert, F. T., on adventitious effects of large masses of gold in contact with tooth tissue, 458
on the relief of pain during dental operations, 331
Vaughan, H. S., "Trigeminal Neuralgia and Neuralgias of More Definite Etiology," 654
Veneer, porcelain or gold, zinc oxyphosphate with, S. G. Perry on, 1209
Vermont and New Hampshire Dental Societies, announcement, 131
Vermont Board of Examiners, 726
Vermont State Dental Society, announcement, 948
Villain, G., report of F. D. I. meeting at Paris, 664
Vincent's angina, 692
Viney, Alfred W., death of, 380
Virginia Board of Examiners, 627
Virginia State Dental Association, announcement, 257, 722
Visick, H., on the relief of pain during dental operations, 334
Vivian, J. T., "Extracting with the Crane Extirpator" (clinic), 582

Von Beust, T., "Pleomorphism and the Pleomorphists: a Plea for Further Investigation of the Micro-organisms of the Deposit upon the Teeth," 658
Von Oefele, F., on the action of the pancreatic secretion on starch, 1271
V-shaped narrow upper arch, 1356
Vulcanite scraps, use of, 610
Vulcanizing, hints on, 120
Vulcanizer, to tighten a, 250
Vulcanizer alarm, 610

Walker, J. M., "Report of a Case of Alveolar Abscess with Extensive Necrosis," 176
Walker, W. E., on orthodontia, 990
on public oral hygiene, 68, 1110
on the relation of diseases of the nose and pharynx to dentistry, 1114
Walker, W. W., on ethics, 216
Wallace, J. F., on the gold inlay, 1371
Walter, G. W., death of, 504
Warner, E. R., address of welcome from the profession in Colorado (National Dental Association), 1094
Washington Board of Examiners, 514
Washington University Dental School, commencement of, 825
Water, hot, in dentistry, J. O. Hall on, 1082
Waters, T. S., on tartar solvent, 568
Watkins, S. C. G., on oral prophylaxis as a special field of work in dentistry, 921
on the relief of pain during dental operations, 332
on the question of susceptibility and immunity to dental caries, 769
Watling, J. A., "Dental Instrument-making," (clinic), 584
Waugh, L. M., "Investigations on Plaque Formation and Dental Caries in Relation to Saliva," 170
"On Dental Caries," 420
on saliva, plaque formation, and dental caries, 1145
Wax, purification of, 609
Wax-carving pencils made of waste investment, 1045
Waxes, pattern, for casting, C. S. Van Horn on, 879
Wax impressions for inlays, removing, without distortion, 608
Wax model and pins, removing together in cast gold inlays, 703
for a gold inlay, making of, J. V. Conzett on, 1345
for a gold inlay, removing from the cavity without distortion, 1046
for a hollow inlay, making a, 610
investing of, in casting, 1414
Wax models for gold castings, R. Porter on (clinic), 235
Wax pattern, polishing, in inlay work, C. S. Van Horn on, 889
Webster, A. E., on dental caries, 480
Weeks, Thomas E., "The Care of the Teeth of Children: Our Duty to the Men and Women of the Future," 738
on some fallacies in orthodontia, 228
Weems, J. M., "Cleanliness in the Dental Office," 1268
Weld, Geo. W., on the question of susceptibility and immunity to dental caries, 768
Wells, Horace, unveiling of the monument to, in Paris, 596, 669
addresses on, delivered at Paris meeting, 670
Paris memorial to, B. L. Thorpe on, 1098
Wells, Merit, death of, 707
West, John B., "Fletcherism and Some of Its Effects on Nutrition," 752
Western Dental College, commencement of, 818
Western Reserve University Dental School, commencement of, 946
West Virginia Board of Examiners, 386
Wetherbee, Irving J., death of, 127
W. D. Miller Dental Club of Pittsburg, 711
What Next? (editorial), 798
Wheeler, C. W. B., "The Jackson System of Orthodontia" (clinic), 233
Wheeler, H. L., "Dental Interne to be Appointed at Bellevue Hospital" (correspondence), 1230
"The Treatment of Children's Teeth," 144
on enamel softening and rehardening as a factor in erosion, 78
on modern oral hygiene, 75
on report of Committee on Practice (New York State Dental Society), 1005
on the practical application of oral hygiene to the school curriculum, 902
Where Praise is Due (editorial), 801
Whinnery, J. C., death of, 1315
White, P. G., "The Practical Application of Oral Hygiene to the School Curriculum," 863
"What We Have to Give," 37
White, W. A., on report of Committee on Practice (New York State Dental Society), 1009
Wilbur, R. A., on free dental dispensary service, 479
Wilbur, W. C., on dental caries, 482
Wilkerson, Basil N., obituary of, 1176
Williams, J. Leon, "The Conditions of Success," 1200
on large masses of gold in contact with tooth tissue, adventitious effects of, 461
on the question of susceptibility and immunity to dental caries, 761
Williams, Dr. (Australia), greeting to F. D. I., 777
Wilson, W. W., death of, 1315
Wire ligatures, how to make tight, 1171
Wiring and re-swaging a gold plate, 939
Wisconsin Board of Examiners, 625, 1423
Wisconsin College of Physicians and Surgeons, Dental Department, commencement of, 945
Wisconsin State Dental Society, 513
Witzel, Karl, "Atlas der Zahnheilkunde in Stereoskopischen Bildern" [Atlas of Dental Science in Stereoscopic Views], review of, 690
Wolfe, A. S., "Porcelain Work" (clinic), 581
Worthen, J. H., on the dentist and the law, 470
Wounds after extractions, treatment of, 1408
Wright, C. M., "Dr. Talbot and the Medical *Ignis Fatuus*" (correspondence), 661
Wyman, John, death of, 53
Wyoming Board of Examiners, 726

Xi Psi Phi Fraternity, New York Alumni Association, 1051

Young, D. H., on cast gold inlays, 367
Young, J. L., "Deficient Development of the Arches of the Deciduous Teeth, and the Necessity of Early Treatment," 1185
on oral prophylaxis as a special field of work in dentistry, 924

Zinc dies, some difficulties in casting, and how to overcome them, 703
Zinc oxyphosphate with porcelain or gold veneer, S. G. Perry on, 1209

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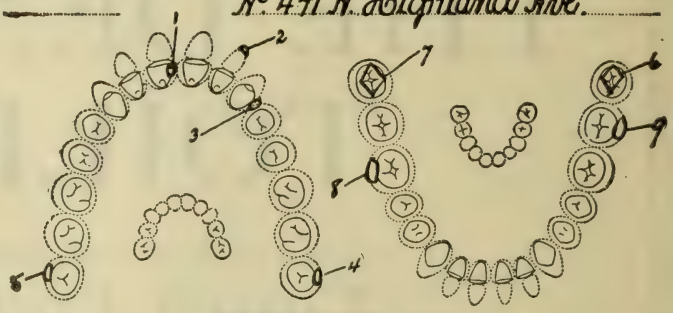
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RECORD CARD

SYSTEM No. 1

Mr. J. H. Robertson p. 283

No 471 N. Highland Ave.



SUGGESTED BY S. H. GUILFORD, A. M., D.D.S.

DATE		No.			HRS.	DR.		CR.	
1907 Jan.	3		Examination		1/2	3			
"	7	1	Gold filling		1	5			
"	15	2.3	" "		1 1/2	7	50		
"	24	4.5	Ph. Zinc "		3/4	4			
"	24	6.7	Amal. "		3/4	4			
Mar.	5	8.9	Gutta Percha		1	5			
						28	50		
Mar.	13		By Cash					8	50
Apl.	1		" "					10	
May	1		" "					10	
								28	50

RECORD CARD

SYSTEM No. 2

Miss L. M. Moore p. 196

1829 Main St



1906 DATE		No.		HRS.	DR.		CR.	
June	20	1	Cement Filling	1/2	2	00		
"	5	2	Porcelain Inlay	1	10			
"	7	3	Gutta Percha Filling	1/2	2			
"	10	4	Specimen	1	5			
"	17	5	Gold Crown		10			
"	17	6	" Filling	1 1/2	8	50		
"	20	7	3 Tooth Bridge		30			
"	25	8	Gold Inlay	1	10			
July	2	9	Amalgam Fine Cut Filling	3/4	3	50		
					81	00		
July	5		By Cash				81	00

CARD INDEX SYSTEMS Nos. 1 and 2—Continued

CASH OR BILL CARDS

ALIKE IN BOTH SYSTEMS

Bills

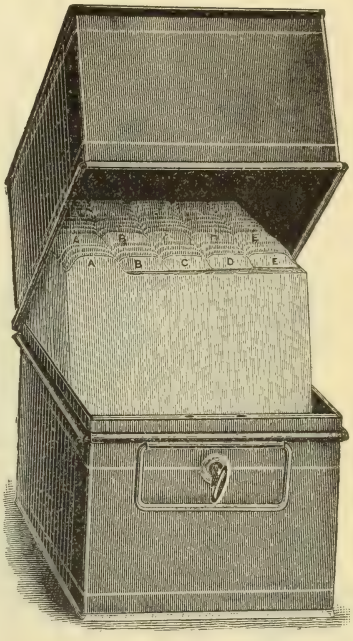
1906			RECD		PAID	
July	1	Andrews, A. F.	13	50		
"	1	Acheson, A. N.	20			
"	1	Gray, W.	38			
"	1	Green, M. O.	87	50		
"	1	Gilbert, R. L.	71			
"	1	Hausman, A.	42	75		
"	1	James, P. J.	21	50		
"	1	Jones, A. P.	68			
"	1	Klauder, M. F.	96			
"	3	Moore, A. M.	81			

Cash

1906			REC'D		PAID	
July	5	Moore, A. M.	81			
"	5	Jones, A. P.	68			
"	5	Hausman, A.	42	75		
"	5	Tyer, R. S.	90	50		
"	6	Satterwood, W.	13			
"	6	Gray, W.	38			
"	6	Acheson, A. N.	20			
"	7	Cummings, P. J.	68			
"	7	Gilbert, R. L.	71			
"	7	Foster, V.	10	50		

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FOR EITHER SYSTEM



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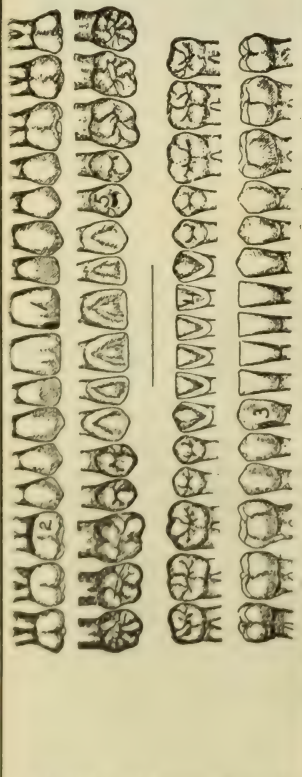


Diagram about two-thirds actual size

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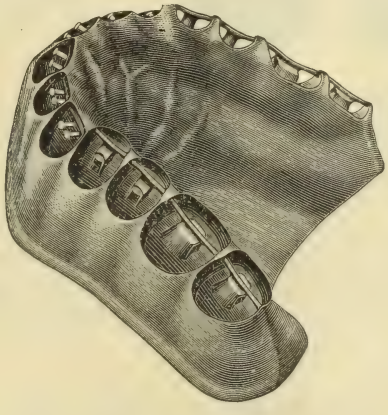
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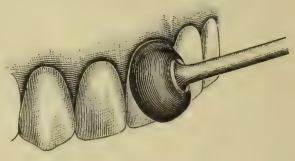
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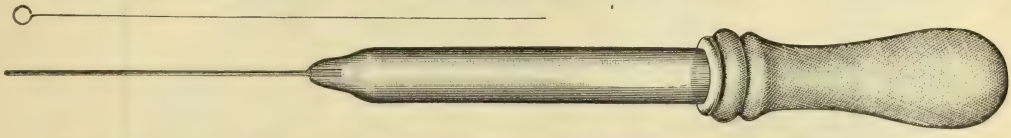
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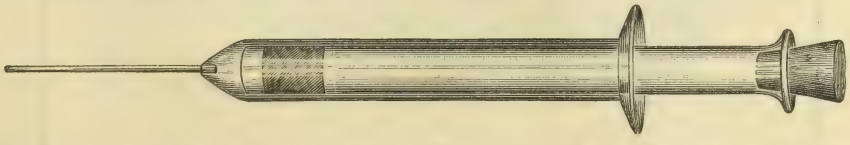
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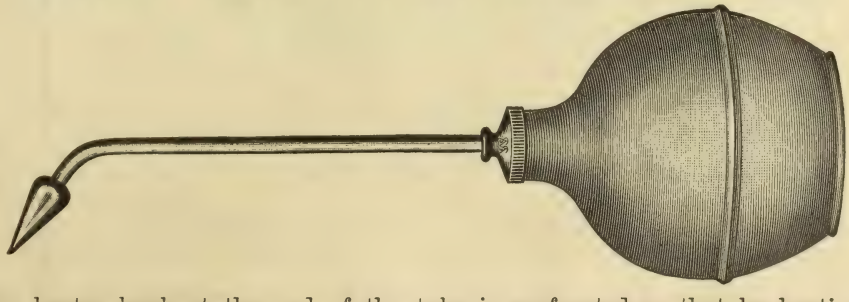
You have here the drop tube idea elaborated to suit the dentist's needs. A platinum pipe, which can be bent to suit the case, is fused into the glass barrel, affording a ready means for injecting medicaments into root-canals, sinuses, pyorrhea pockets, etc., or placing a drop or two of alcohol in a root-canal to dry it. It is capable of delicate manipulation, and is readily cleaned. Shown full size, with cleaning wire. $1.00.

ABSCESS SYRINGE No. 35A (Aseptic)



This form comprises a glass barrel with platinum tube fused in, with the open (rear) end flared to form a finger-hold, and operated by a piston. The piston is also of glass, hollow, recessed near the end for a packing, which is readily removed and replaced. A cork stopper makes the piston a convenient receptacle for soluble medicated granules, etc. Easily cleaned and made aseptic. $0.85.

HOT AIR SYRINGE No. 38



The heater knob at the end of the tube is perforated so that by heating it, with the bulb compressed, and then allowing the bulb to expand it is filled with sterilized air drawn through the heated knob, through which it is again directed to the cavity or canal, drying it perfectly. $0.60.

Improved Corona Gold

IT is quite evident from the flattering reception it has had that many dentists were "taken" with the fine working qualities of Corona Gold and the results it enabled them to achieve.

It's better still, now. An improved method of manufacture gives it greater compactness, without compression, greater uniformity of that compactness, without losing a whit of its soft working quality or abating a jot of its cohesiveness under the plugger or the density of the completed filling.

We don't claim that it is the "perfection" of gold filling materials, but it has taken us a long step in that direction. It has a clean, bright surface, is peculiarly soft, extremely plastic. It has the maximum of cohesiveness, its long interlacing fibers in such close touch with one another that the instrument quickly welds them into a dense, hard, resistent mass. Because of its compactness it has no tendency to crumble or fall apart, nor does the point of the instrument pierce the gold, but instead carries it to place and condenses it there.

Corona is a fast-working gold. But don't try to hurry the filling by attempting to pack too large masses. It isn't that kind of a gold. Use it in little bits, thoroughly condensing each one before you introduce another, and you will be surprised at the rapidity with which you build up a filling which will please you and your patient by its solidity. Sold in mass.

Per $\frac{1}{8}$ oz.		$4.00
In lots of $\frac{1}{2}$ oz. or more	per oz.	30.00
Test package	1/40 oz.	1.00

Weston's Insoluble Cement



THE best evidence of the quality of an article is its continued use and increasing sales through a long period of years in the face of strong rivalry. **Weston's Insoluble Cement** is an example. Since its introduction, thirty-one years ago, cement after cement has been brought forward. Some of these have affected the sales of Weston's for a time, but it has always rallied and gone on to wider use than before. The first ten months of this year show a greater aggregate sale for **Weston's Insoluble Cement** than any previous entire year.

There can be but one reason,—the Cement is a good one. It is good from the dentist's standpoint because of its uniformity, its easy mixing, its satisfactory hardening, and its durability as a filling. It is good from the dealer's view, because it is a "repeater,"—it makes business for him without cost to him, because the dentist who once uses it comes back for more.

The two colors, gray and yellow, of the Weston Two-Color Case, enable the dentist to match most of the cases which come to him. The bottles are ounce size, giving large quantities of liquid and powder. The price is the lowest at which any such quantity of any cement is sold to the dentist. You may find as large packages, but the price *to you* will be two to four times as much, made so to give the dealer an exorbitant discount and so enlist his active service in selling it. In Weston's Insoluble you get the low price and you get a sterling cement.

Price	per case	$0.75
"	lot of 10 cases	7.00
" Liquid or Powder	per bottle	.25

The Simonson Mouth-Piece

FOR SALIVA EJECTORS

Orifice protected from stoppage by the "return" of the end of the tube

Furniture Pamphlet

Crenshaw Contour Matrices

No. 5 for Incisors and Cuspids
No. 6 for Molars
No. 7 for Bicuspids

Price . . . Each $3.00

Operative Instruments Pamphlet

Hill's Stopping

The oldest of Gutta-Percha Stoppings. On the market over half a century, and still commanding a wide sale. Makes an excellent filling, with the advantages which Gutta-Percha confers.

In $\frac{1}{2}$-oz., $\frac{1}{4}$-oz., $\frac{1}{10}$-oz., $\frac{1}{20}$-oz. boxes.

Price . . per oz. $5.00

Filling Materials Pamphlet

THE S. S. WHITE DENTAL MFG. CO., SOLE SALES AGENT

Perfectly Reproducing Inlay Models

A perfect model for a cast gold inlay is of little value unless your investment will reproduce its every detail without noticeable enlargement or contraction. **The S. S. White Inlay Investment Compound** was devised for this special need. It is fine ground, gives a sharp reproduction, and stands the high heat necessary in melting the gold. With all its fineness it is slightly porous, so that the wax of the model when heated up preparatory to casting passes into it,—disappears,—leaving a sharp, clean mold.

Price .....per box $0.50

ORTHODONTIA

Malposition of the Human Teeth

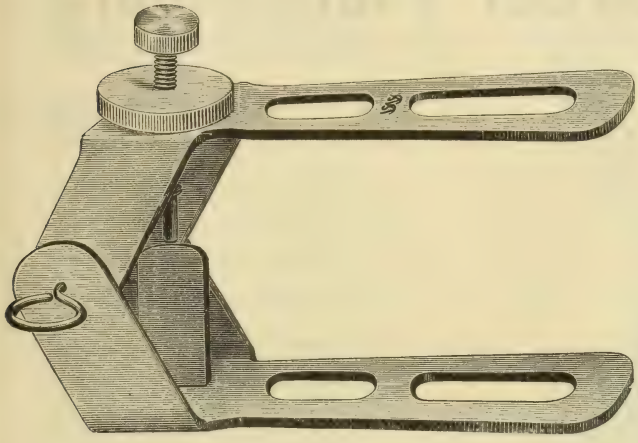
By S. H. GUILFORD, A.M., D.D.S., Ph.D.

Professor of Operative and Prosthetic Dentistry in the Philadelphia Dental College; Author of "Nitrous Oxide," etc. Fourth edition, thoroughly revised. Cloth, net, $2.50. This edition has been brought abreast in every way with the most recent advances in the department of dental effort of which it treats.

THE S. S. WHITE DENTAL MFG. CO., Sole Sales Agent

Crown Articulator No. 5

Suggested by DR. P. G. C. HUNT



The advantages of Dr. Hunt's Articulator in adjusting and adapting small or partial dentures have been demonstrated in the practice of many dentists during the past twenty years. It is especially useful, as it affords a view of the palatal as well as the buccal faces of the teeth. It is also useful in the making of inlays, or in any small work on the lines indicated.

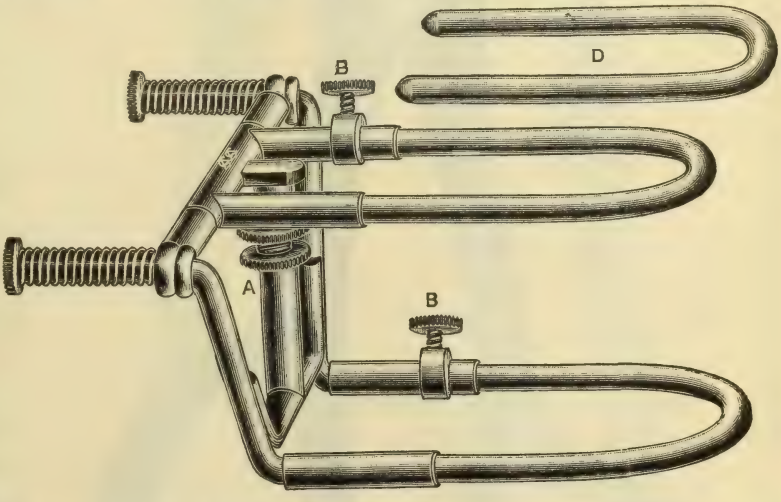
Made of wrought metal, producing a stiff, reliable appliance.

Price .....each $0.40

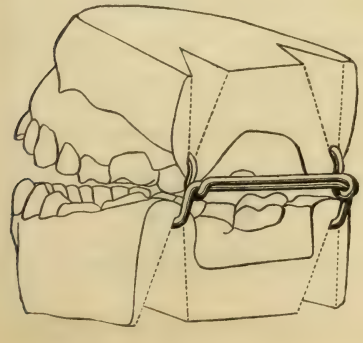
Anatomical Articulator No. 7

The "Anatomical" Articulator (our No. 7) closely reproducing the movements of the human jaw, is a modification of Dr. Bonwill's original pattern. A standard and stop for fixing or for raising or lowering the bite by means of the milled nuts A is provided.

One very decided advantage of this form is that it has four pairs of interchangeable bows. An articulation or bite made with one pair can be detached, and another pair substituted for the taking of the next. A single No. 7 Articulator thus serves the purpose of four ordinary articulators.



Price, complete, with 4 Upper and 4 Lower Bows $2.25



Orthodontia (Separable) Hinge

Invented by
DR. RUDOLF SYKORA

PATENTED DECEMBER 1, 1908

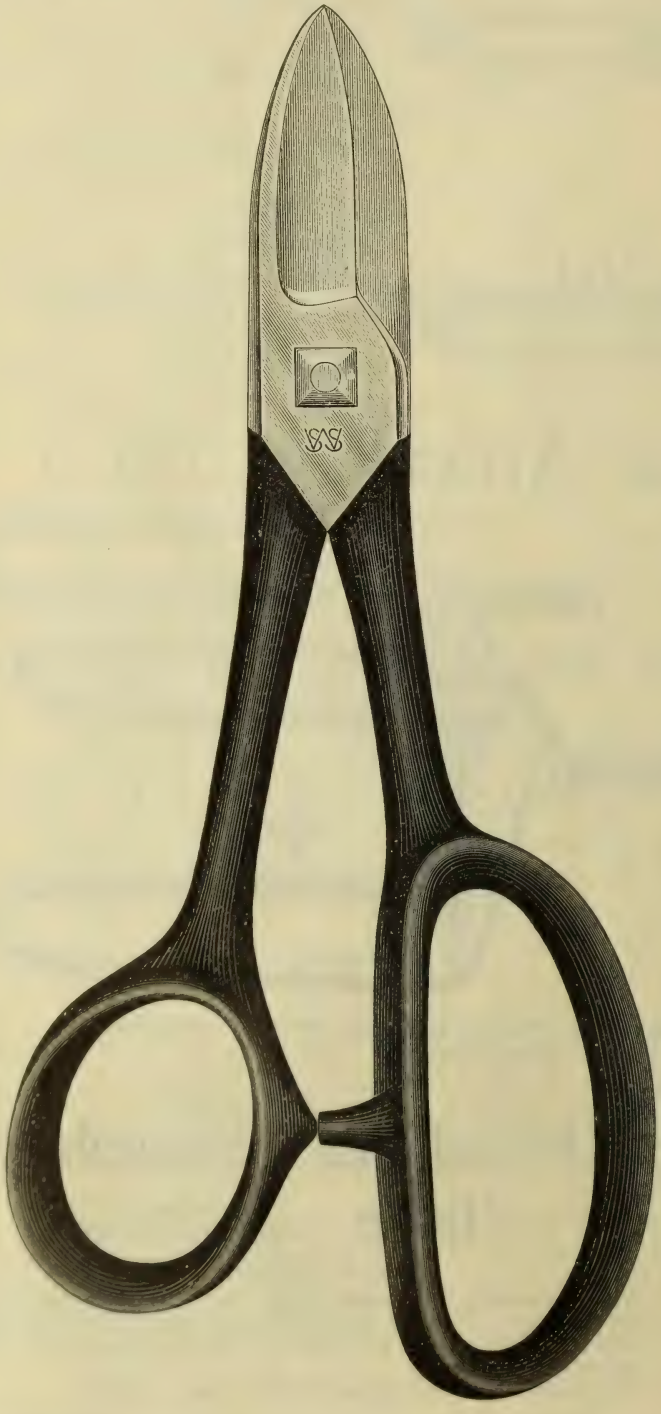
In this simple but effective device the orthodontia practitioner has the means of largely reducing the expense of the many models required in his work. It affords as perfect articulation as more expensive appliances.

Four sizes, Nos. 1, 2, 3, and 4; No. 1 the smallest.

Price .....each $0.15

THE S. S. WHITE DENTAL MFG. CO., SOLE SALES AGENT.

S.S.White "Full Cut" Plate Shears



The **Plate Shears** that cut equally well at any part of the blades; that will take hold at the heel and make a clean, smooth shear clear to the points.

You don't have to force them, don't have to "hack" at the plate to get it cut; their blades have no tendency to push it away from them; they just take hold of it and go right through it with the mere closing of the handles. That is the reason they are called **"Full Cut."**

You've never seen any other shears which cut clasp-plate like them, because no others will do it.

Carefully made and every pair tested before going into stock.

$1.25

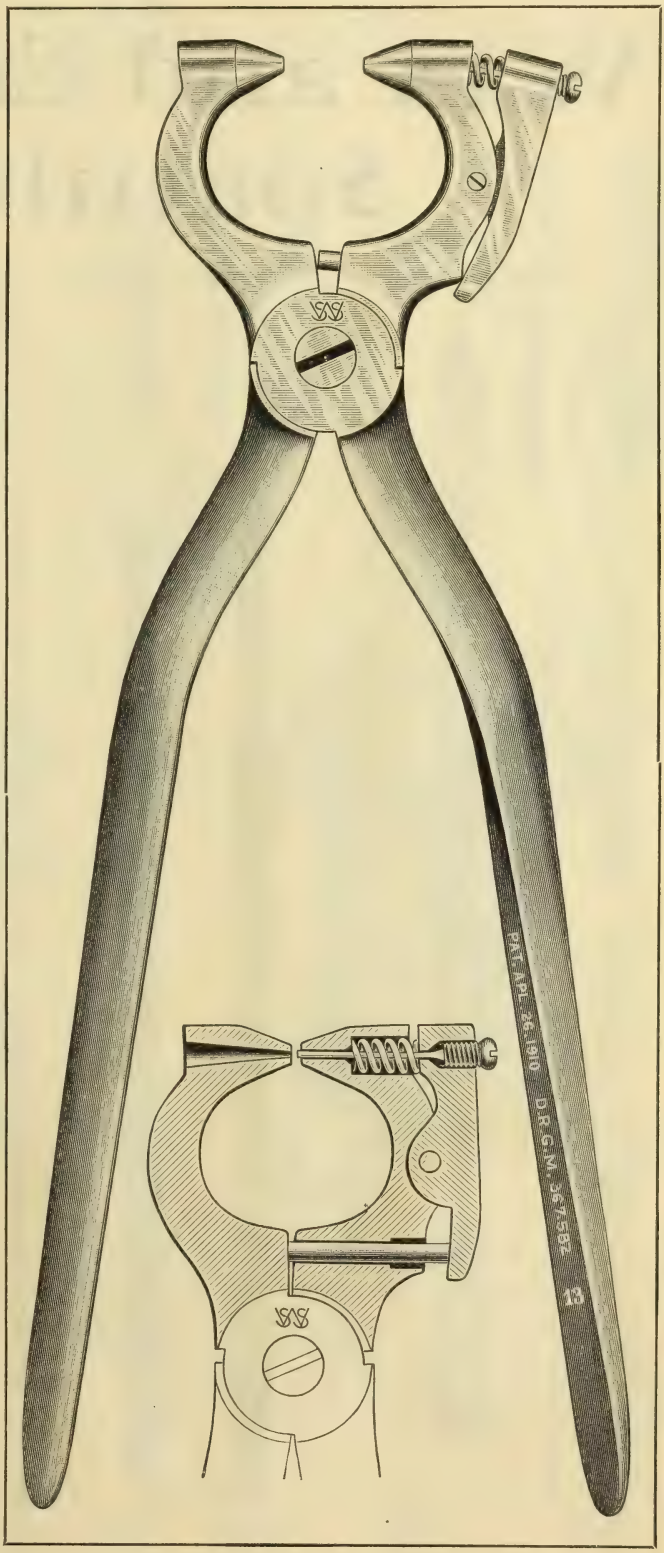
S. S. WHITE PLATE PUNCH No. 13

The **Plate Punch** which actually punches a clean-cut hole in any plate used by dentists, and which the instant the grip on the handles is relaxed releases itself automatically.

It repeats these operations—instant punching and automatic release—as fast as you can close and release the handles, with never a hitch or halt in either.

You have no conception of how efficient a plate punch may be till you've had our **No. 13** in your working hand and a piece of plate in the other. And it's durable, will last a lifetime; nothing to wear out but the little punch pin, for which a new one can be substituted in a moment. **Plate Punch No. 13** is well worth its price.

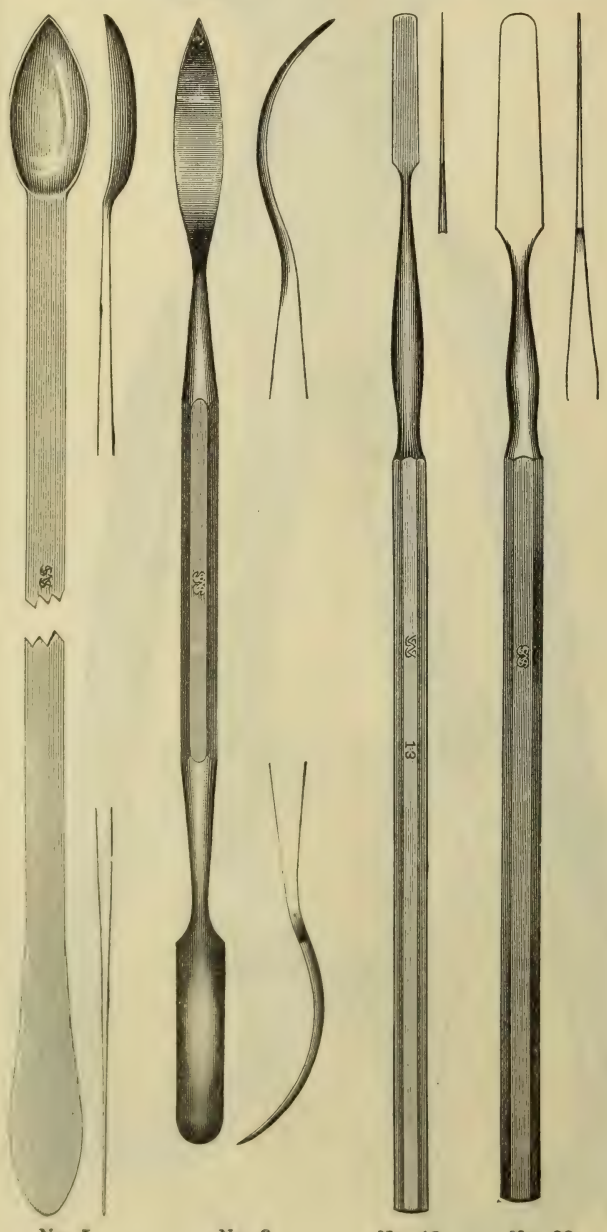
$5.00



Wax and Cement Spatulas

Wax Spatulas

Cement Spatulas



No. 5 $0.25

No. 2 $0.40

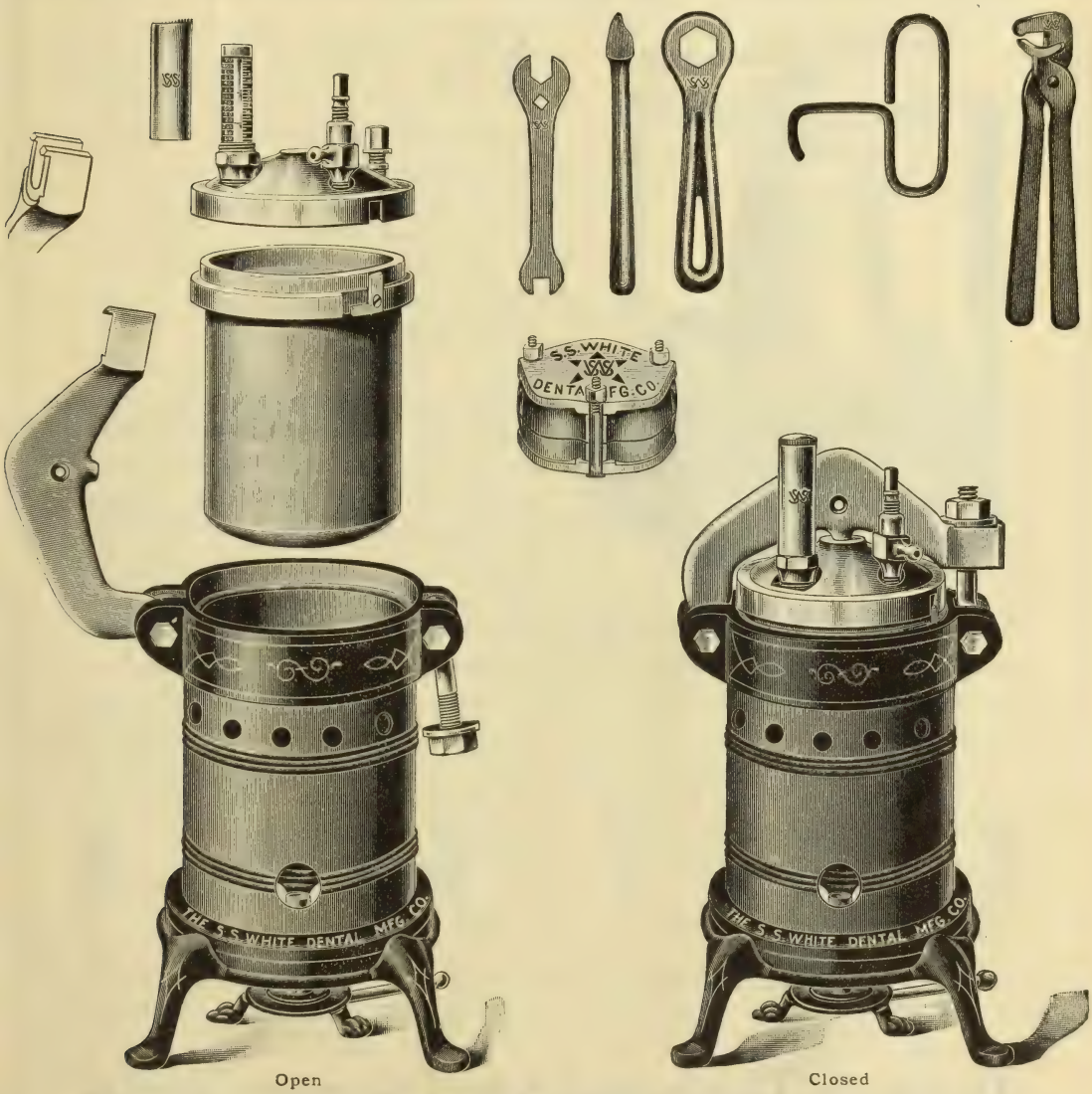
No. 13 $0.25

No. 22 $0.25

You want entirely different characteristics in a wax spatula from those in a spatula for mixing cements. In the former case, you have to carry and lead and carve the wax; it goes into the flame often, needs no temper. For mixing cements, you require above all things a spring temper, and shapes adapted to the rapid and thorough incorporation of powder and liquid into a plastic mass. These points are exemplified in the many forms of Spatulas which bear our trade-SS-mark. Because of their adaptation to their work and their careful manufacture you will find them more satisfactory, more durable than any others.

Our full line, comprising the accepted forms of both varieties, illustrated and described in our "Miscellaneous" pamphlet, which is sent free on request.

A Dependable Vulcanizer



Open Closed

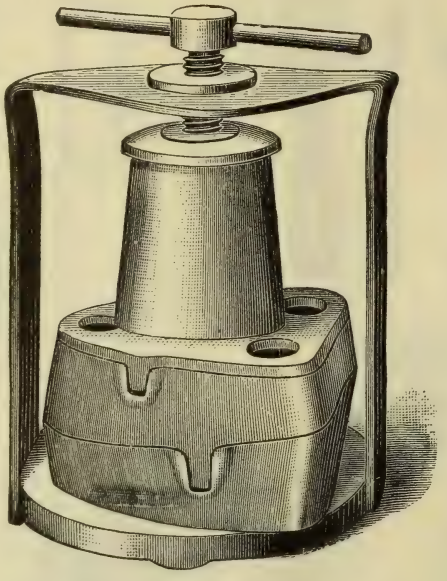
THE more you study the **MANN VULCANIZER** and its outfit, the better you become convinced of its completeness and adaptability; the longer you work with it the surer you are that it is thoroughly reliable.

You see that it has ample strength, that the device for securing the cover is quickly manipulated and certain in operation, that its guard against leakage of steam is effective,—that, in a word, it has every requisite for a safe, sure, dependable Vulcanizer.

Full description in our Vulcanizer pamphlet. Entire outfit as shown included in price.

Two-case Vulcanizer for Gas, Alcohol, or Kerosene, $18.00
Three-case " " " " " " 20.00

Closing Flasks Without Bolts



YOU can close your flasks preparatory to vulcanizing without the need of bolts if you use the **Donham Spring Clamp.** This appliance was originally intended to work only with the special flask devised for it, but it will work equally well with the Star or Anchor flask, or any other of the proper size which has the necessary guide lugs.

It is really a more expeditious method than with the use of the bolts. You simply leave off the bolts, bring the parts of the flask together after packing, set it in the Clamp, put on the tension slightly, and the flask will close when the rubber melts, and thereafter be under tension automatically until you are ready to open it. Manipulated in this way, there is little risk of applying forcible pressure before the rubber softens, or of spreading or cracking the teeth or investment, while a plate of the thickness of the wax is assured.

Two sizes, for two flasks and three flasks; a single flask can be used in the two-flask size by the aid of the metal blank as shown. Will take, besides its own special flask, the Star (small) and Anchor flasks.

The Donham flask, made especially for this Clamp is without bolts. It is of the three-part variety, with guide-lugs at the sides and vent-holes in the top plate. Size 3 x 2 13/16 inches inside. In brass and iron.

Donham Spring Clamps for 2 or 3 Flasks .....each $1.25
Brass Flasks ..... " 1.50

Donham Tempered Steel Spring Clamp

(LARGE SIZE)

Corroborating the increasing popularity of the method of closing the vulcanizing flask described above, we have received enough requests for a size of the **Donham Spring Clamp** to take the large Star flask to make it seem worth while to grant them.

We therefore announce a larger size of the Clamp, made of tempered steel for this use. It is well made and nickel-plated. $1.75.

HAMMOND FUSED OXIDE CEMENT

Fused Oxide, as the name implies, is a thoroughly vitrified metallic Oxide and is ground to an impalpable powder. The Liquid is made from pure materials, and the combination of liquid and powder, well spatulated, produces a homogeneous mass which sticks well to the walls of the cavity and sets like stone.

It was introduced to the Dental Profession eighteen years ago and its large and ever-increasing sales prove its value.

Besides its high value as a filling-material, it is excellent as a setting for inlays, its fineness and strength permitting its use in the extremely attenuated state necessary. Six colors.

Per box, two bottles of powder and one of liquid $1.50
" six boxes 7.50

Send for Filling-Materials Pamphlet.

HAMMOND WHITE GOLD ALLOY

This Alloy was placed on the market in 1891, consequently for nineteen years has been in the dentists' hands proving its merits and the claims made for it. It is made from pure metals, the percentage of gold being sufficient to render it tough, permanent and beautiful. When properly finished with a high polish, it holds its metallic whiteness indefinitely. It has also great edge strength and is free from shrinkage. Individual fillings of this Alloy have withstood the severe duties of the mouth for from twelve to eighteen years, convincing proof of its value.

Per oz. $3.00. 5 ozs. $12.50. 10 ozs. $22.50.



For Sale. Twenty years' practice and best equipped office and best location in the city of Tallahassee, Florida. Object, retirement. References, First National Bank and Capital City Bank, Tallahassee, Florida. R. A. SHINE, D.D.S.

For Sale. Up-to-date office, complete modern equipment, desirable location. Owner connected with large manufacturing business which has made sudden demands for all of his attention. Address "WHITNEY BLDG.," P. O. Box 1566, care Wm. M. Williams, Springfield, Mass.

For Sale. A good dental practice with new and up-to-date outfit in Western North Carolina town of 4000. Average about $4000 annual income. Office equipped with modern conveniences. Only those who mean business need apply. Address "W. N. C.," care S. S. White Dental Mfg. Co., Grant Building, Atlanta, Ga.

Wanted. A dentist, either male or female, to assist in dental work in California. Applications will be given attention on December 24th. Address "A," care DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

Wanted. Dental practices. My method is time-tried and brings quick sales without publicity. Big list of buyers. Write for information. Unlocated dentists write for bargain sale lists. Mention states desired. *The Dentist's Middleman*, "C. M. CRYOR, D.D.S.," Box L, Franklin Grove, Ill.

For Rent. Unfurnished office in Pennsylvania town of fifteen thousand, occupied by dentist twenty years; present occupant retiring on account of age. All dentists in town have more than they can do. A fine opportunity for a dentist who will attend to business. This town is the metropolis of an industrial neighborhood of 125-mile radius. NORMAN LOEB, 526 Jefferson st., Philadelphia, Pa.

BACK VOLUMES OF THE DENTAL COSMOS

Owing to discontinuance of reserve files, we have a limited number of complete volumes prior to 1890, which, while they last, will be supplied as follows:

UNBOUND, per volume $1.00
BOUND " " 2.35

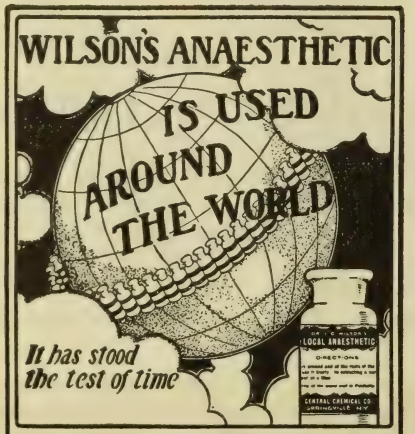
On bound volumes or more than one unbound volume, the cost of carriage must be paid by purchaser.
These rates apply only to complete volumes. Single numbers or broken volumes will be charged for at the rate of 25 cents per copy.

The S. S. White Dental Mfg. Co., Publisher

WE, the makers of Antiphlogistine, stand to lose should we make any claim which is not strictly in accordance with the facts. You, the dentists, are both judge and jury, and we can't get away from the verdict.

When we state, therefore, that Antiphlogistine may be safely used on the outside of the cheek in a case of alveolar inflammation, without fear of causing an abscess which will break on the outside, you can depend upon it that our statement is backed up by clinical experience.

THE DENVER CHEMICAL MFG. CO., New York



PRICE
In One or Two Ounce Bottles
1 oz., $0.60; 6 ozs., $3.00; 12 ozs., $5.40
24 ozs., $9.60
In Hermetically Sealed Tubes
1 box, $0.75; 6 boxes, $3.75; 12 boxes $6.75; 24 boxes, $12.00

Central Chemical Co.
Springville, Erie Co., N. Y.

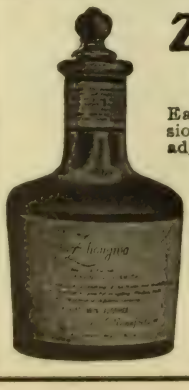
IN THE MOUTHS OF MANY

Welch's Gold & Platina Alloy

has proved its case. Forty years the favorite. A Pioneer, still the leader of high-grade Alloys. Readily amalgamated, unusually plastic and cohesive for the largest contours.

One Troy oz., $2.50; five oz., $11.00; ten oz., $20.00. Also in half-oz. packages, $1.25. **Dr. Welch's Amalgam, of silver and tin,** $2.00 per oz.; $7.00 for four oz.; $15.00 for ten oz. Samples on request.

T. B. WELCH CO.
5919 Woodbine Ave., Philadelphia



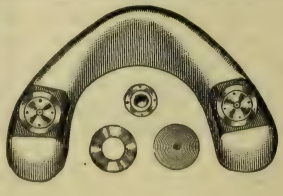
ZHONGIVA

For the Mouth and Gums

Earnestly commended to the Profession as a positive prompt and reliable adjunct in their treatment of Alveolar Pyorrhea and for all Inflamed Conditions of the Mouth, Recession of the Gums, Gingivitis, Spongy Gums, etc. Prompt and pleasant to use.

Send for sample; a trial is positively convincing.

JAMES J. OTTINGER
Manufacturer
20th & Spruce Sts., Phila., Pa.



STOP

That disagreeable "bone or dish rattle" by using the

"EUREKA"



$2.00
per Box Three Sets

EUREKA SUCTION CO., Loudonville, Ohio

LISTERINE

The best antiseptic for a dentist's prescription

As a daily wash for the preservation of the teeth, and for maintaining the mucous membrane of the mouth in a healthy condition, Listerine occupies a first place in dental and oral therapeutics. Listerine is truly prophylactic, in that it exercises an inhibitory action upon the acid-forming bacteria of the mouth, and thus maintains the alkaline condition so necessary for the welfare of the teeth.

LISTERINE TOOTH POWDER

An innovation, in that it possesses neither fermentative nor harshly abrasive ingredients, Listerine Tooth Powder very acceptably meets all the requirements of a frictionary dentifrice, and promises to give much satisfaction to those who employ it, in conjunction with a mouth-wash of Listerine, suitably diluted.

The undersigned will be pleased to send supplies of Listerine Tooth Powder samples for distribution to patients, upon receipt of the dentist's professional card, and this advertisement.

Lambert Pharmacal Co., St. Louis, Mo., U. S. A.

Salvitae

THE AFTER-THOUGHT

The after-thought becomes the most despicable of human devices when surreptitiously applied to the furtherance of an iniquitous personal advantage.

PYORRHEA ALVEOLARIS

Since it became demonstrably certain that pyorrhea alveolaris is a disease of systemic origin and, as such, requires internal treatment, effort has been made by numerous individuals having extraordinary, if not praiseworthy, commercial acumen to put to use as remedies for this disease preparations previously exploited for entirely unrelated maladies. To these individuals, pyorrhea alveolaris, as a field of fortune, was an after-thought—their therapeutic offerings should be viewed accordingly.

SALVITAE

SALVITAE is the most efficacious and trustworthy agent available for the internal treatment of pyorrhea alveolaris, by virtue of the fact that it was evolved especially for the purpose of relieving the systemic conditions which give rise to this disease. In the case of SALVITAE, pyorrhea alveolaris was *the inspirer*, not *the after-thought*. It was, in great measure, through the employment of this preparation that the curability of pyorrhea alveolaris by internal treatment became an established fact.

SALVITAE is an effervescent salt of delightful flavor. The dose is from one to four teaspoonfuls, in a glassful of water, three or four times daily.

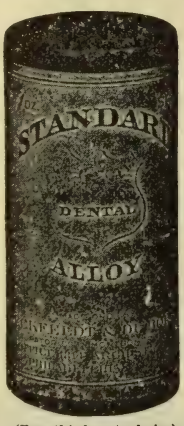
AMERICAN APOTHECARIES COMPANY, ASTORIA, GREATER NEW YORK



DEAR DOCTOR:—

A DISTINCTIVE SERVICE YOU CAN RENDER PATIENTS AND YOURSELF

THE constant wearing of dentures which have not been properly cleaned cannot fail to injure the patient's health. The extensive area renders it susceptible to contamination. ¶ Dentures can be properly cleaned by the use of The Purifying Plate Powder of Dr. John H. Meyer. This used with Dr. Meyer's Plate Brush, removes the mucoid deposits and renders the surfaces of the denture practically sterile. Is a preserver of natural teeth where partial plates, regulating appliances, or removable bridge work are worn. ¶ It will benefit you as well as your patients to see that these specialties are kept in stock regularly by the Dental Dealer or Retail Druggist in your vicinity.



(Two-thirds actual size)

Standard Alloy

Stands alone in availability where inlays or foil fillings would demand cruel cutting. Dr. S. G. Perry told the N. Y. Odontological Society (COSMOS for June 1909): "If cavities are situated in the back of the mouth where the work will not show, I fill them in the most careful manner with the (Eckfeldt & DuBois) **Standard Alloy.** By doing this in the most painstaking way I feel that I have done the very best that is known to-day. . . . I am compelled to single out this alloy for mention because my contention for this mode of practice rests on the use of an alloy that has good edge strength and that stays exactly where it has been placed. Its plastic property enables one to give any desired shape to the filling so that contours are easily restored. . . . Note that *I do not allude to amalgams as they are ordinarily made and used.*"

Beware of other alloys sold as "Standard Alloy."

Send for Historical-Descriptive Circulars

ECKFELDT & DuBOIS
1314 Arch St., Philadelphia

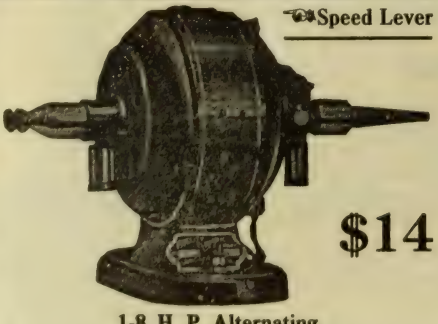
It is a matter of health

℞ SANITOL

TRADE MARK
BEST FOR THE TEETH

Liquid, Powder, Paste, Brush, Children's Brush.

There is no substitute.



$14

1-8 H. P. Alternating With Speed Control

Note the Improvement

WE have added to our ⅛ H. P. Alternating Polishing Motor a lever on the motor giving 100 per cent. speed variation. Our price for this motor with two attachments remains the same as before—$14.00 net complete. Any dentist cannot afford to be without this necessary motor. Made for direct current at the same price.

FIDELITY ELECTRIC CO.
LANCASTER, PA.

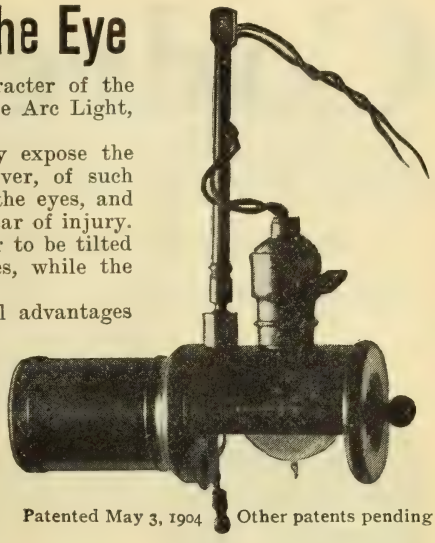
The Light that is Restful to the Eye

The Lewis Illuminator combines the mellow character of the Incandescent Lamp with the penetrating power of the Arc Light, but eliminates the Arc's glaring whiteness.

It produces a light of sufficient power to clearly expose the remotest portion of the oral cavity—a light, however, of such mellowness that it is restful rather than trying to the eyes, and you may use it every day and all the time without fear of injury.

The "ball and socket joint" enables the Illuminator to be tilted so not a ray of light can strike the operator's eyes, while the bracket tray remains flooded with light.

The circular goes into detail concerning additional advantages and its method of construction. Your Dealer will supply the Lewis Illuminator.



Patented May 3, 1904 Other patents pending

Lewis Illuminator, any finish, including vertical arm, 6 feet silk cord and lamp	$12.00
No. 1, Ferro-nickel finish and 110-volt lamp furnished unless otherwise specified.	
Oxydized-copper or Full Nickel Bracket, extra	3.70

Three finishes supplied:—

No. 1, Ferro-nickel, black. Ferro-nickel yields an intensely black and smooth surface, preferable in many ways to any other finish, being more lasting and not readily tarnished. Strongly recommended.

No. 2, Oxydized copper. Oxydized copper is the usual spotted finish.

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**ANESTHETIC.
ASTRINGENT.
HEMOSTATIC.**

This preparation unites the remarkable anesthetic property of cocaine with the equally pronounced astringent and hemostatic properties of adrenalin chloride. It prevents and alleviates pain; it mitigates bleeding. It is

Invaluable in Tooth Extraction and Other Operations.

When **Codrenin** is injected into the gum or subcutaneous tissues, the adrenalin of the formula renders the part almost bloodless, a condition existing sometimes for hours. The circulation of the blood in the part being thus suspended in a measure, the action of the cocaine is localized, anesthesia is rendered more lasting, and the danger of toxic effect is minimized.



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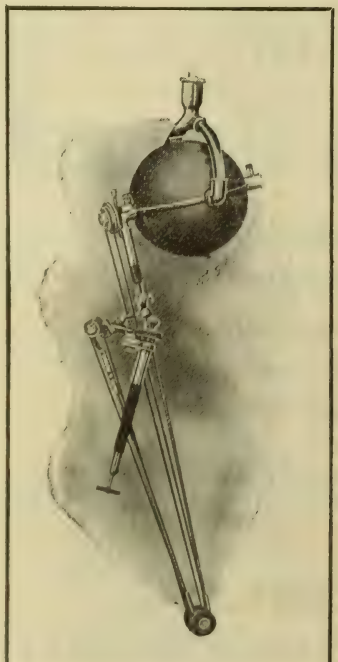
℞ *"A":* Each fluidounce contains Cocaine Hydrochloride, 9 1-5 grains (2%); Adrenalin Chloride, 1-36 grain (1:15,000); Chloretone, 2 1-4 grains.
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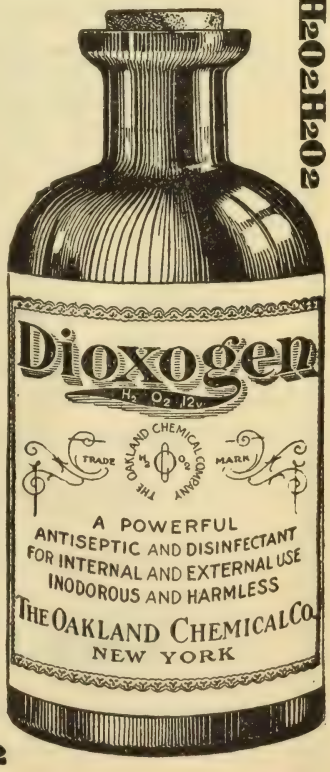
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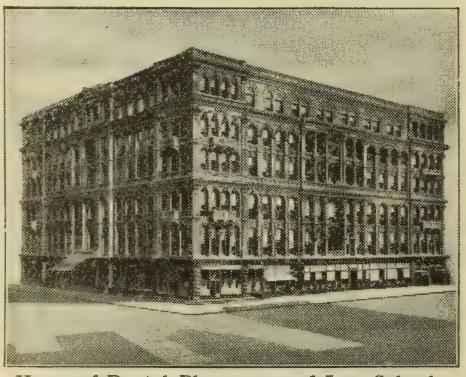
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THE regular Winter Session commences on October 1st of each year and ends in the following May.

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1910-1911

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Commencing October 1, 1895, women will be admitted to this College, subject to the same requirements as men.

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Gymnasium and Howard Houston Club, Membership Fee each year	10.00
Dissecting Fee, including material—First and Second Year, each	6.50

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University of Pennsylvania SCHOOL OF DENTISTRY

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All of the departments of practical laboratory and clinical instruction are in charge of competent and experienced demonstrators who are ably assisted in the work of instruction by a full corps of expert assistants.

The Dental Department of the University is an integral part of the University system. Its students at the discretion of the Dean are permitted to take courses of instruction in other departments of the University without additional fees, and are eligible to participate in all those features of University life common to the whole student body of the institution. These include its athletic features and privileges of the Howard Houston Hall, the club house of an organization governed by the University students and having all the appointments and desirable features of a strictly first-class club. The dormitories of the University are the best of their kind in this country, and to these the students of dentistry are admitted in common with the students of all the other departments.

THE ANNUAL SESSION

The session 1910-11 begins Friday, September 23d, and ends at commencement, the third Wednesday in June. (No student admitted to the regular course after October 10th.) The number of lecturers per week, with a synopsis of the various branches taught, will be found in the General Catalog.

The course of instruction extends over a period of THREE YEARS.

In order to facilitate work in the practical branches and to economize the student's time, the regular session is so arranged that students during the first year are required to devote the time equally to DENTAL HISTOLOGICAL AND CHEMICAL LABORATORY WORK. During the second and third years the student has practically the entire forenoon of each day for dental work. Thus ample opportunity is afforded for practice in OPERATIVE AND MECHANICAL DENTISTRY. In the latter branches the students of the first year are divided into sections, devoting the time not otherwise engaged to practice in the operating rooms.

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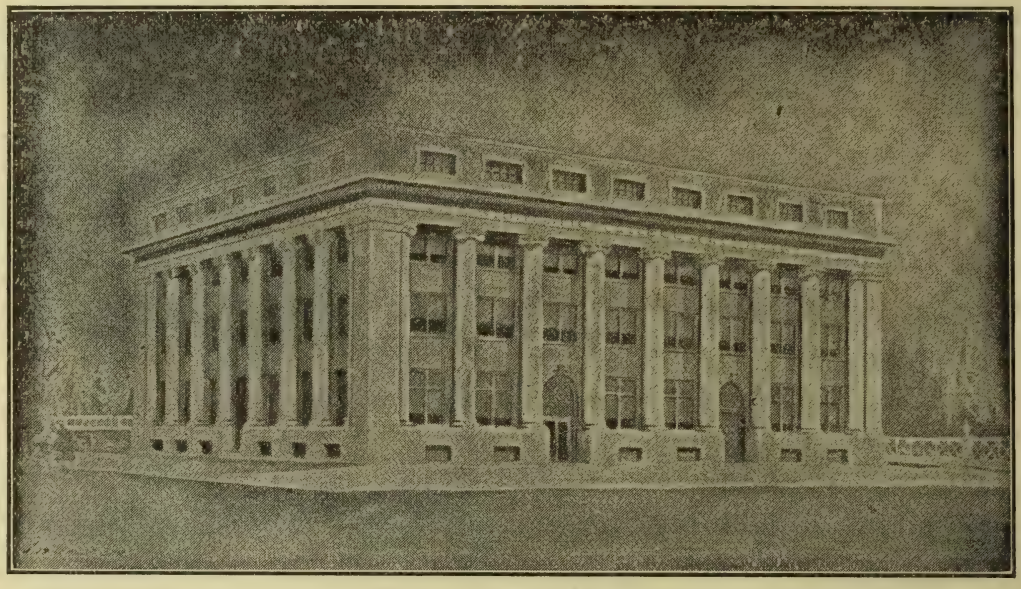
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